VERMILION
Oil & Gas
Australia Pty. Ltd.

VERMILION OIL & GAS AUSTRALIA

WANDOO FIELD EXPLORATION DRILLING ENVIRONMENT PLAN

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Revision	Date	Originator	Checkers	Approver
0	8 September 2025	Xodus	Environmental Advisor Well Construction Manager Engineering Manager	Managing Director

Revision History

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0	8 September 2025	Issued for Use	Xodus	Environmental Advisor Well Construction Manager Engineering Manager	Managing Director

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10	Wandoo Control Room	X	X

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Abbreviations and Definitions

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ACHIS	Aboriginal Cultural Heritage Inquiry System
AEP	The Australian Energy Producers
AFMA	Australian Fisheries Management Authority
AFZ	Australian Fishing Zone
AHTS	Anchor Handling Transport Supply
AIATSIS	Australian Institute of Aboriginal and Torres Strait Islander Studies
AIS	Automatic Identification System
ALARP	As Low As Reasonably Practicable
AMOSC	Australian Marine Oil Spill Centre
AMP	Australian Marine Park
AMSA	Australian Maritime Safety Authority
API	American Petroleum Institute
APPEA	Australian Energy Producers
AS	Australian Standards
bbl	Barrel
BHA	Bottom Hole Assembly
BIA	Biologically Important Area
BOP	Blow-Out Preventer
BRS	Bureau of Rural Sciences
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
BWM	Ballast Water Management
BWMS	Ballast Water Management System
CAES	Compressed-Air Energy System
CASA	Australian Civil Aviation Safety Authority
CBA	Cost Benefit Analysis
CEE	Catastrophic Environmental Event
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CHARM	Chemical Hazard Assessment and Risk Management
CIA	Cumulative Impact Assessment
CMS	Competency Management System
CO_2	Carbon Dioxide
CoP	Cessation of Production
cP	centiPoise
CPF	Central Production Facility
CSIRO	Commonwealth Scientific and Industrial Research Organisation

Cth	Commonwealth
DAFF	Department of Agriculture, Fisheries and Forestry
DAWE	Department of Agriculture, Water and the Environment
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy and the Environment and Water
DEE	Department of the Environment and Energy
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety (WA)
DEWHA	Department of Environment, Water, Heritage and the Arts
DNP	Director of National Parks
DP	Dynamic Positioning
DPAW	Department of Parks and Wildlife
DPIE	Department of Planning and Environment (NSW)
DPIRD	Department of Primary Industries and Regional Development
EEZ	Exclusive Economic Zone
EPBC Act	Environment Protection and Biodiversity Convention Act 1999
EMBA	Environment that May be Affected
EP	Environment Plan
EPA	Environmental Protection Authority
EPO	Environmental Performance Outcomes
EPS	Environmental Performance Standards
ESD	Ecologically Sustainable Development
ETL	Export Trunkline
FITs	Formation Integrity Tests
FPU	Floating Production Unit
GHG	Greenhouse Gases
H_2S	Hydrogen Sulphide
HMCS	OSPAR Harmonised Mandatory Control Scheme
HSE	Health, Safety and Environment
HSE MS	Health, Safety and Environment Management System
HTB	High-temperature Blend
HQ	Hazard Quotient
IAP	Incident Accident Plan
IAPP	International Air Pollution Prevention
IFC	International Finance Corporation
IMCRA	Integrated Marine and Coastal Regionalisation of Australia
IMO	International Maritime Organisation
IMMR	Inspection, Monitoring, Maintenance and Repair
IMS	Invasive Marine Species
IOGP	International Association of Oil and Gas Producers
ISO	International Organisation for Standardisation

ITOPF	International Tanker Owners Pollution Federation
IUCN	International Union Conservation
IWC	International Whaling Commission
KEF	Key Ecological Feature
LAT	Lowest Astronomical Tide
LCM	Lost Circulation Materials
LNG	Liquefied Natural Gas
LOR	Lowest Observable Reading
LOTs	Leak Off Tests
LOWC	Loss of Well Control
LWD	Logging While Drilling
MAA	Mutual Assistance Agreement
MARPOL	International Convention for the Prevention of Pollution from Ships
MARS	Maritime and Aircraft Reporting System
MDO	Marine Diesel Oil
MMO	Marine Management Organisation
MNES	Matters of National Environmental Significance
MO	Marine Order
MoC	Management of Change
MODU	Mobile Offshore Drilling Unit
MWD	Measurement While Drilling
NEPM	National Environment Protection Measure
NGER Act	National Greenhouse and Energy Reporting Act 2007
NMFS	National Marine Fisheries Service
NNTT	National Native Title Tribunal
NO_2	Nitrogen Dioxide
NOAA	National Oceanic and Atmospheric Administration
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NT	Northern Territory
NWMR	North-west Marine Region
NWS	North-west Shelf
OCNS	Offshore Chemical Notification Scheme
ODS	Ozone Depleting Substance
OGP	International Association of Oil and Gas Producers
OPEP	Oil Pollution Emergency Plan
OPGGSA	Offshore Petroleum and Greenhouse Gas Storage Act 2006
OPGGS(E)R	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2006
OSAT	Oil Science Advisory Team
OSMP	Operation and Scientific Monitoring Program
OSPAR Convention	Oslo-Paris Convention 1992

OSRL	Oil Spill Response Limited
OSTM	Oil Spill Trajectory Modelling
P&A	Plug and Abandon
PAH	Polycyclic Aromatic Hydrocarbons
PEC	Predicted Effect Concentration
PHG	Pre-hydrated Gel
PLONOR	Pose Little or No Risk to the Environment
PMS	Planned Maintenance System
PMST	EPBC Act Protected Matters Search Tool
PNEC	Predicted No Effect Concentration
POB	Persons on Board
PSZ	Petroleum Safety Zone
PTS	Permanent Threshold Shift
QLD	Queensland
RATSIB	Representative Aboriginal/Torres Strait Islander Bodies
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
ROV	Remote Observation Vehicle
RR	Residual Risk
RWP	Relief Well Plan
SCERP	Source Control Emergency Response Plan
scf	Stress Concentration Factor
SDS	Safety Data Sheet
SEEMP	Ship Energy Efficiency Management Plan
SEL	Sound Exposure Levels
SIMAP	Spill Impact Mapping Analysis Program
SMPEP	Shipboard Marine Pollution Emergency Plan
SO_2	Sulphur Dioxide
SOLAS	International Convention for the Safety of Life at Sea
SOPEP	Shipboard Oil Pollution Emergency Plan
SPL	Sound Pressure Level
SWMR	South-West Marine Region
TD	Total Depth
TTS	Temporary Threshold Shift
TVDRT	True Vertical Depth referenced to Rotary Table
UCH	Underwater Cultural Heritage
UK	United Kingdom
UKOOA	The United Kingdom Offshore Operators Association
UNCLOS	United National Convention on the Law of the Sea 1982
UNESCO	United Nations Educational, Scientific and Cultural Organisation
USA	United States of America

UXO	Unexploded Ordnance
VOGA	Vermilion Oil & Gas Australia Pty Ltd
VSP	Vertical Seismic Profiling
WA	Western Australia
WBM	Water Based Mud
WCD	Worst Case Discharge
WCSM	Well Construction Standards Manual
WHP	Wellhead Platform
WOMP	Well Operations Management Plan

Section 1 Introduction

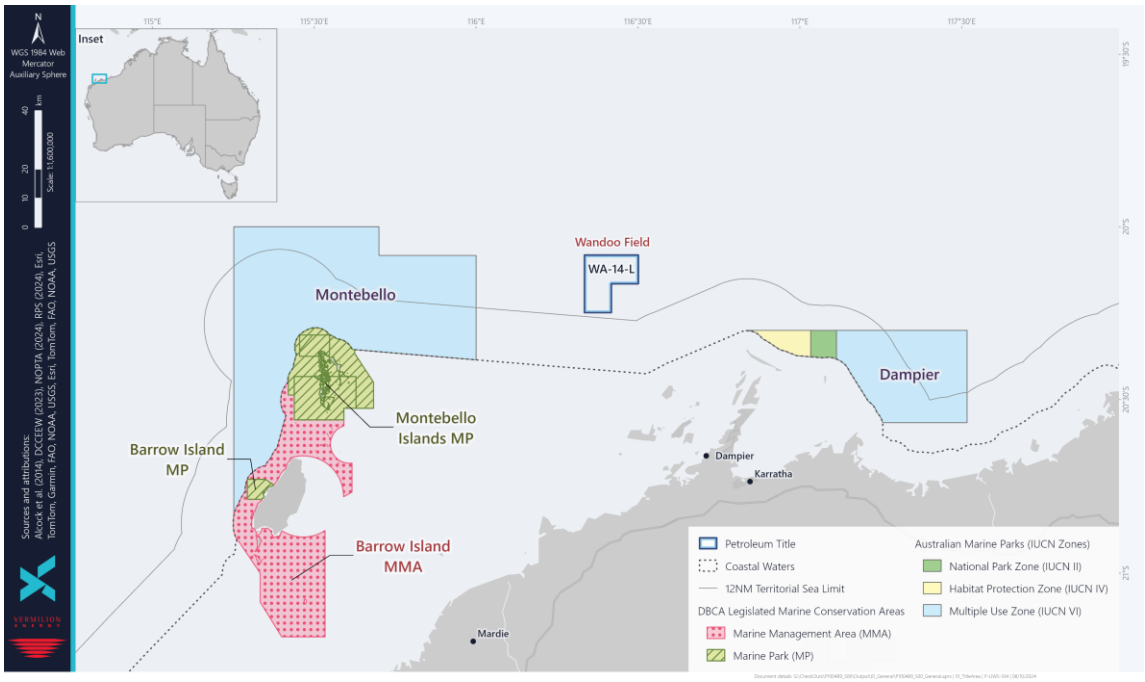
1.1 Background

Vermilion Oil & Gas Australia Pty Ltd (VOGA) currently operates the Wandoo Field within WA-14-L and is planning near field exploration drilling. The exploration drilling will be carried out using a Mobile Offshore Drilling Unit (MODU) at up to 7 prospect locations, all within WA-14-L. This Environment Plan (EP) has been prepared to allow for the exploration drilling and support activities.

Exploration drilling activities are proposed within an Operational Area around the 7 prospects near the existing facilities. The exploration drilling will likely take 15-20 days per well. The total, maximum days expected for the exploration drilling activities is estimated to be 140 days.

WA-14-L is located in Commonwealth waters in the Carnarvon Basin off the northwest coast of Western Australia (WA), approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island (Figure 1-1).

Figure 1-1: WA-14-L location



1.2 Environment Plan Summary

This Wandoo Field Exploration Drilling EP Summary has been prepared from material provided in this EP. The summary consists of Table 1-1 as required by Regulation 35(7) of the Commonwealth Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (OPGGS(E)R).

Table 1-1: Summary of material required for an EP

Material Requirement	Section of EP containing material requirement
The location of the activity	Section 2.2
A description of the receiving environment	Section 3.3
A description of the activity	Section 2
Details of the environmental impacts and risks of the activity	Section 5
The control measures for the activity	Section 7
The arrangements for ongoing monitoring of the titleholder's environmental performance	Section 8 8.10
Response arrangements in the oil pollution emergency plan	Section 8.8 Oil Pollution Emergency Plan Appendix E
Consultation already undertaken and plans for ongoing consultation	Section 9 Appendix F
Details of the titleholder's nominated liaison for the activity	Section 1.3

1.3 The Proponent

VOGA is the titleholder of production licence WA-14-L. VOGA is a wholly owned subsidiary of Vermilion Energy Inc., a Canadian-based oil and gas exploration and production company. VOGA acquired operatorship of the permit at the beginning of 2005 after purchasing the share of the permit from the previous operator, ExxonMobil.

VOGA titleholder details are:

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1.4 Scope and Purpose of the Environment Plan

The purpose of this EP is to document the potential environmental impacts and risks and planned mitigation and management measures associated with exploration drilling within Australian Commonwealth waters in production licence WA-14-L in the Wandoo Field, approximately 80 km north north-west of Dampier, WA.

The activities covered in this EP include:

- MODU—includes positioning, and general (non-drilling) operation activities
- Drilling—includes drilling and contingency activities
- Formation evaluation—reservoir appraisal activities
- Well abandonment—plug and abandonment activities, including wellhead removal
- Field support—includes support vessels, helicopters and Remotely Operated Vehicles (ROVs).

Activities excluded from the scope of this EP are:

- Vessel operations within Port Boundaries or State waters given they are managed under the *Shipping and Pilotage Act 1967* (WA) as administered by the relevant Port Authority under the *Port Authorities Act 1999* (WA)
- Vessel operations within Commonwealth waters outside of the Operational Area, given they are managed under the *Navigation Act 2012* (Cth) as administered by the Australian Maritime Safety Authority (AMSA).

The EP details the arrangements in place for ensuring that the potential environmental impacts and risks associated with the activities are reduced to As Low As Reasonably Practicable (ALARP) and are of an acceptable level. This EP has been prepared in accordance with the requirements of the OPGGS(E)R.

The implementation strategy contained in this EP will ensure that the exploration drilling activities comply with all statutory requirements and the requirements of the VOGA Health, Safety and Environment Management System (HSE MS). To ensure its continued suitability, a review of this EP will be undertaken in the event that the activities do not occur continuously and a period of 12 months or more passes before activities are to recommence (see Management of Change (MoC) process outlined in Section 8.5). Any significant departure from

the activity, environment, risks, control measures, etc. detailed in the EP, will be identified and assessed. If required, the EP will be revised and resubmitted in accordance with Regulation 39 of the OPGGS(E)R.

Figure 4-2 illustrates how this EP addresses each of the key requirements for the content of an EP, ensuring fulfilment of Part 4 of the OPGGS(E)R.

1.5 Corporate Environmental Performance Philosophy

VOGA is committed to minimising the adverse environmental impacts of its operations and to meeting all regulatory requirements associated with those operations. As stated in the Company Health, Safety and Environment (HSE) Policy, VOGA will:

- Accept responsibility and accountability for providing leadership, visible commitment, direction and resources to meet HSE performance targets
- Maintain a strong HSE management system to identify and manage risks
- Integrate HSE into business objectives
- Make a positive contribution to the protection of the environment in which it operates
- Respond promptly and effectively to emergencies
- Focus on continual improvement in HSE performance
- Communicate openly and fairly on a timely basis with fellow employees and contractors, the public, governments, management and other relevant persons.

A copy of the VOGA HSE Policy is included in Appendix A.

1.6 Applicable Legislation and Codes

This section details the requirements that apply to the activity including relevant legislation, codes, other approvals and conditions. The Commonwealth *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGSA) controls exploration and production activities. The OPGGS(E)R stipulate the requirements for EPs to ensure that petroleum activities are carried out in an acceptable manner. VOGA carries out a review of applicable legislation each year, including recovery plans, conservation advices and management plans.

1.6.1 Commonwealth Requirements

The Operational Area lies within Commonwealth waters. Commonwealth legislation and other requirements relevant to the activity area are described in Table 1-2. Related international conventions are included.

This EP considers the impacts to matters of national environmental significance (MNES) protected under Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Table 1-3 summarises relevant species conservation advices and recovery plans issued by the Department of Climate Change, Energy and the Environment (DCCEEW).

Table 1-2: Relevant Commonwealth legislation and other requirements

Legislation	Scope	Related international conventions	Administering authority
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	The Act enables the Australian Government to protect important Indigenous areas and objects under immediate threat. Areas and objects protected under this Act are included in the National Heritage List and Commonwealth Heritage List. **Application to activity**: Areas or objects protected under this Act may be present within the Project Areas.	-	DCCEEW
Assessing and Managing Impacts to Underwater Cultural Heritage in Australian Waters – Guidelines on the application of the *Underwater Cultural Heritage Act 2018* (DCCEEW, 2024a) (UCH Guidelines)	Provides guidance on applying the *Underwater Cultural Heritage Act 2018* in relation to assessing impact and mitigation measures of offshore developments. **Application to activity**: The guidelines will inform impact assessment and mitigation strategies required in this EP.	-	DCCEEW
Australian Ballast Water Management Requirements (DAWE, 2020)	The Australian Ballast Water Management Requirements set out the obligations on vessel operators with regards to the management of ballast water and ballast tank sediment when operating within Australian seas. **Application to activity:** Provides requirements on how vessel operators should manage ballast water when operating within Australian seas to comply with the *Biosecurity Act 2015*.	International Convention for the Control and Management of Ships' Ballast Water and Sediments (adopted in principle in 2004 and in force on 8 September 2017)	Department of Agriculture, Fisheries and Forestry (DAFF) (formerly DAWE)
Australian Biofouling Management Requirements (DAFF, 2023).	The Australian biofouling management requirements set out vessel operator obligations for the management of biofouling	-	DAFF

Legislation	Scope	Related international conventions	Administering authority
	when operating vessels under biosecurity control within Australian waters. **Application to activity**: Provides requirements on best practice for biofouling management and apply to all operators of vessels subject to biosecurity control.		
*Australian Maritime Safety Authority Act 199*0	This Act facilitates international cooperation and mutual assistance in preparing and responding to a major oil spill incident and encourages countries to develop and maintain an adequate capability to deal with oil pollution emergencies. Requirements are affected through AMSA who administers the National Plan for Maritime Environmental Emergencies (NatPlan). **Application to activity**: AMSA is the designated Control Agency for oil spills from vessels in Commonwealth waters.	International Convention on Oil Pollution Preparedness, Response and Cooperation 1990 Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties 1969 Articles 198 and 221 of the United Nations Convention on the Law of the Sea 1982	Australian Maritime Safety Authority (AMSA)
Biosecurity Act 2015 Biosecurity Regulations 2016	This Act is the primary legislation for the management of the risk of diseases and pests that may cause harm to human, animal or plant health, the environment and the economy. The objects of this Act are to: (a) manage biosecurity risks; human disease; risks related to ballast water; biosecurity emergencies and human biosecurity emergencies; (b) give effect to Australia's international rights and obligations, including under the	International Convention for the Control and Management of Ships' Ballast Water and Sediments (adopted in principle in 2004 and in force on 8 September 2017)	DAFF

Legislation	Scope	Related international conventions	Administering authority
	International Health Regulations, the Sanitary and Phytosanitary Agreement and the Biodiversity Convention. **Application to activity**: The Biosecurity Act and regulations apply to 'Australian territory' which is the airspace over and the coastal seas out to 12 nm from the coastline. For the activity the Act regulates vessels entering Australian territory regarding ballast water and hull fouling.		
Climate Change Act 2022	This Act outlines Australia's greenhouse gas emissions reduction targets and codifies Australia's net 2030 and 2050 Greenhouse Gas (GHG) emissions reductions targets under the Paris Agreement. It also requires the minister to prepare an annual climate change statement and requires the Climate Change Authority to give the minister advice in relation to the annual statement and future emissions reductions targets. **Application to activity:** While industry is not directly subject to these obligations, this Act legislates Australia's emissions net zero targets.	Paris Agreement on Climate Change 2015 (ratified by Australia)	DCCEEW
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act applies to actions that have, will have or are likely to have a significant impact on matters of national environmental or cultural significance. The Act protects MNES and provides for a Commonwealth environmental assessment and approval process for actions. There are 9 MNES: • World heritage areas	1992 Convention on Biological Diversity and 1992 Agenda 21 Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973 Agreement between the Government and Australia and the Government of Japan for the Protection of Migratory Birds and	DCCEEW

Legislation	Scope	Related international conventions	Administering authority
	• National heritage places • Ramsar wetlands • Listed Threatened species and communities • Listed Migratory species under international agreements • nuclear actions • Commonwealth marine areas • Great Barrier Reef Marine Park • water resources for coal seam gas and coal mining developments. **Application to Activity**: Petroleum activities are excluded from within the boundaries of a World Heritage Area (Sub regulation 10A(f)). The activity is not within a World Heritage Area. The EP must describe matters protected under Part 3 of the EPBC Act and assess any impacts and risks to these. The EP must assess any actual or potential impacts or risks to MNES from the activity.	Birds in Danger of Extinction and their Environment 1974 Agreement between the Government and Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment 1986 Agreement between the Government of Australia and the Government of the Republic of Korea on The Protection of Migratory Birds 2006 Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (Ramsar) International Convention for the Regulation of Whaling 1946 Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979	
Environment Protection and Biodiversity Conservation Regulations 2000	Part 8 of the regulations provide distances and actions to be taken when interacting with cetaceans. **Application to activity**: The interaction requirements are applicable to the activity in the event that a cetacean is sighted.	-	DCCEEW
Environment Protection (Sea Dumping) Act 1981	This Act provides for the protection of the environment by regulating dumping matter	-	DCCEEW

Legislation	Scope	Related international conventions	Administering authority
	into the sea, incineration of waste at sea and placement of artificial reefs. **Application to activity**: May be triggered if equipment remains on the seabed following decommissioning.		
Fisheries Management Act 1991	This Act provides for the protection of Australia's offshore commercial fish resources from 3 nm to the extent of the Australian Fishing Zone (200 nm). There are no fisheries within the Operational Area however there are several within the Environment that May Be Affected (EMBA). **Application to Activity**: Fishermen in Commonwealth-managed fisheries will be informed by VOGA (via AMSA) of program activity as required by legislation.	-	Australian Fisheries Management Authority (AFMA) DAFF
Marine Pest Plan 2018–2023: National Strategic Plan for Marine Pest Biosecurity (DAWR, 2018)	Australia's national strategic plan for marine pest biosecurity. It outlines a coordinated approach to building Australia's capabilities to manage the threat of marine pests. It represents agreed priorities and actions of governments, marine industries, and other stakeholders to achieve a common purpose: to manage the risks posed by marine pests and minimise their potential harm to marine industries, communities and the environment. The implementation period for Marine Pest Plan 2018-2023 concluded on 30 June 2023 and a formal review of the document is underway. Until a new document or strategy is published, this document will continue to be consulted.	-	DAFF

Legislation	Scope	Related international conventions	Administering authority
	Application to activity: Applying the recommendations within this document and implementing effective biofouling controls can reduce the risk of the introduction of Invasive Marine Species (IMS).		
Minamata Convention on Mercury	Australia ratified the Minamata Convention on 7 December 2021. It is an international treaty that seeks to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. The Convention includes controls on: • Mercury mining • The manufacture and trade of mercury and products containing mercury • Disposal of mercury waste • Emissions of mercury from industrial facilities. Countries that have ratified the Convention are bound by international law to put these controls in place. **Application to activity**: Provides requirements for how mercury waste must be treated and disposed.	Minamata Convention on Mercury	DCCEEW
National Biofouling Management Guidelines for the Petroleum Production and Exploration Industry 2009 (MPSC, 2018)	The guidance document provides recommendations for the management of biofouling risks by the petroleum industry. **Application to activity**: Applying the recommendations within this document and implementing effective biofouling controls can reduce the risk of the introduction of IMS.	International Maritime Organisation (IMO) Guidelines for the Control and Management of Ships Biofouling to Minimize the Transfer of Invasive Marine Species (2023)	DAFF

Legislation	Scope	Related international conventions	Administering authority
National Greenhouse and Energy Reporting Act 2007 (NGER Act) National Greenhouse and Energy Reporting Regulations 2008 National Greenhouse and Energy Reporting (Measurement) Determination 2008	This Act introduces a single national reporting framework for the reporting and dissemination of information about the greenhouse gas emissions, greenhouse gas projects, and energy use and production of corporations. Under the NGER Act, businesses who are very large emitters of greenhouse gases will be required by law to measure and report their emissions to the government. National Pollutant Inventory reporting is covered by this Act.	United Nations Framework Convention on Climate Change (UNFCCC) 1992 Vienna Convention for the Protection of the Ozone Layer 1985 and the Montreal Protocol on Substances that Deplete the Ozone Layer 1987	DCCEEW /Clean Energy Regulator
National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c)	The Guidelines outline the process to be followed where there is the potential for artificial lighting to affect wildlife. **Application to activity**: Applying the recommendations within this document and implementing effective controls can reduce the impact of light to sensitive receptors.	-	DCCEEW
National Strategy for Reducing Vessel Strike on Cetaceans and other Marine Megafauna (CoA, 2017a)	The overarching goal of the strategy is to provide guidance on understanding and reducing the risk of vessel collisions and the impacts they may have on marine megafauna. **Application to activity**: Implementing the recommendations and controls can reduce the risk of vessel collisions with megafauna.	-	DCCEEW
Native Title Act 1993 *Native Title Legislation Amendment Act 2021*	The main objects of this Act are: (a) to provide for the recognition and protection of native title (b) to establish ways in which future dealings affecting native title may proceed and to set standards for those dealings	-	Attorney-General's Department

Legislation	Scope	Related international conventions	Administering authority
	(c) to establish a mechanism for determining claims to native title (d) to provide for, or permit, the validation of past acts intermediate period acts, invalidated because of the existence of native title. **Application to activity:** Native Title may be present within the EMBA.		
Navigation Act 2012	This Act regulates ship-related activities and invokes certain requirements of the International Convention for the Prevention of Pollution from Ships (MARPOL) relating to equipment and construction of ships. Several Marine Orders (MO) are enacted under this Act relating to offshore petroleum activities, including: • MO 21: Safety of navigation and emergency arrangements • MO 30: Prevention of collisions • MO 31: Vessel surveys and certification. **Application to activity**: The relevant vessels (according to class) will adhere to the relevant MO regarding navigation and preventing collisions in Commonwealth waters.	Certain sections of MARPOL International Convention for the Safety of Life at Sea (SOLAS) 1974 Convention on the International Regulations for Preventing Collisions at Sea 1972 (COLREGs) United Nations Convention on the Law of the Sea 1982 (UNCLOS)	AMSA
Offshore Petroleum and Greenhouse Gas Storage Act 2006 (OPGGSA) Offshore Petroleum and Greenhouse Gas Storage	The Act addresses all licensing, health, safety, environmental and royalty issues for offshore petroleum exploration and development operations extending beyond the three-nautical mile limit. Part 4 of the OPGGS(E)R specifies that an EP must be prepared for any petroleum activity	-	National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA)

Legislation	Scope	Related international conventions	Administering authority
(Environment) Regulations 2023 (OPGGS(E)R)	and that activities are undertaken in an ecologically sustainable manner and in accordance with an accepted EP. **Application to activity**: The OPGGSA provides the regulatory framework for all offshore petroleum exploration and production activities in Commonwealth waters, to ensure that these activities are carried out: • Consistent with the principles of ecologically sustainable development as set out in section 3A of the EPBC Act • So that environmental impacts and risks of the activity are reduced to As Low as Reasonably Practicable (ALARP) • So that environmental impacts and risks of the activity are of an acceptable level.		
Protection of the Sea (Prevention of Pollution from Ships) Act 1983	This Act regulates Australian regulated vessels with respect to ship-related operational activities and invokes certain requirements of the MARPOL Convention relating to discharge of noxious liquid substances, sewage, garbage, air pollution etc. **Application to activity**: All ships involved in petroleum activities in Australian waters are required to abide to the requirements under this Act. Several MOs are enacted under this Act relating to offshore petroleum activities, including: • MO 91: Marine Pollution Prevention – Oil	Various parts of MARPOL Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 (also known as the London Protocol)	AMSA

Legislation	Scope	Related international conventions	Administering authority
	• MO 95: Marine Pollution Prevention – Garbage • MO 96: Marine Pollution Prevention – Sewage • MO 97: Marine Pollution Prevention – Air Pollution.		
Protection of the Sea (Harmful Antifouling Systems) Act 2006	Under this Act, it is an offence for a person to engage in negligent conduct that results in a harmful anti-fouling compound being applied to or present on a ship. The Act also provides that Australian ships must hold 'anti-fouling certificates', provided they meet certain criteria. **Application to activity**: All ships involved in offshore petroleum activities in Australian waters are required to comply with Act. The MO 98: Marine Pollution Prevention – Anti-fouling Systems is enacted under this Act.	International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001	AMSA
Underwater Cultural Heritage Act 2018	Protects the heritage values of shipwrecks, sunken aircraft and relics (older than 75 years) in Australian Territorial waters from the low water mark to the outer edge of the continental shelf (excluding the State's internal waterways). The Act allows for protection through the designation of protection zones. Activities / conduct prohibited within each zone will be specified. **Application to activity**: In the event of removal, damage or interference to shipwrecks, sunken aircraft or relics declared to be historic under the legislation, activity is	Agreement between the Netherlands and Australia concerning old Dutch Shipwrecks 1972	DCCEEW

Legislation	Scope	Related international conventions	Administering authority
	proposed with declared protection zones, or there is the discovery of shipwrecks or relics.		

Table 1-3: Relevant recovery plans and species conservation advices relevant to the Wandoo Field Exploration Drilling EP

Relevant plan/advice	Applicable threats or management advice	Addressed in EP section
Threat Abatement Plan for the impacts of Marine Debris on Vertebrate Wildlife of Australia's Coasts and Ocean (DEE, 2018)	The objectives of the plan include seeking to understand the scale of marine plastic and microplastic impact on key species, ecological communities and locations.	Section 5.10
Birds		
Approved Conservation Advice for *Anous tenuirostris melanops* (Australian lesser noddy) (TSSC, 2015b)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the Australian lesser noddy. **Threats:** • Marine pollution: evaluate risk of oil spill impact to nest locations and, if required, appropriate mitigation measures are implemented.	Section 5.14 and 5.15
Approved Conservation Advice for *Calidris canutus* (Red Knot) (DCCEEW, 2024b)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the red knot. **Threats**: • Marine pollution: evaluate risk of oil spill impact to nest locations and, if required, appropriate mitigation measures are implemented.	Section 5.14 and 5.15
Approved Conservation Advice for *Calidris tenuirostris* (Great knot) (DCCEEW, 2024c)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the great knot. **Threats**: • Habitat loss and degradation: prevent destruction of key breeding and migratory staging sites. • Marine pollution: evaluate risk of oil spill impact to nest locations and, if required, appropriate mitigation measures are implemented.	Section 5.14 and 5.15
Approved Conservation Advice for *Calidris ferruginea* (Curlew sandpiper) (DCCEEW, 2023a)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the curlew sandpiper. **Threats:** • Habitat loss and degradation: maintain undisturbed feeding and roosting habitat at sites on the north-west coast used during migration for the species.	Section 5.14 and 5.15
Approved Conservation Advice for *Charadrius mongolus* (Lesser sand plover) (TSSC, 2016)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the lesser sand plover. **Threats**: • Habitat loss and degradation from pollution, changes to water regimes and invasive plants.	Section 5.10

Relevant plan/advice	Applicable threats or management advice	Addressed in EP section
Approved Conservation Advice for *Pterodroma mollis* (soft-plumaged petrel) (TSSC, 2015a)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the soft-plumaged petrel. **Threats**: • Not applicable.	N/A
Approved Conservation Advice for *Papasula abbotti* (Abbott's booby) (TSSC, 2020a)	Conservation advice provides management actions that can be undertaken to ensure the conservation of Abbott's booby. **Threats**: • Loss of breeding habitat on Christmas Island.	Section 5.14 and 5.15
Conservation Advice for *Sternula albifrons* (little tern) (DCCEEW, 2025a)	Conservation advice provides management actions that can be undertaken to ensure the conservation of little tern. **Threats**: • Loss or degradation of nesting habitats.	Section 5.14 and 5.15
Approved Conservation Advice for *Sternula nereis nereis* (fairy tern) (TSSC, 2011)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the fairy tern. **Threats**: • Marine pollution: evaluate risk of oil spill impact to nest locations and, if required, appropriate mitigation measures are implemented.	Section 5.14 and 5.15
National Recovery Plan for Albatrosses and Petrels (2022) (DCCEEW, 2022)	The recovery plan is a co-ordinated conservation strategy for albatrosses and petrels. **Threats:** • Marine pollution • Marine debris • Marine infrastructure interactions (including lighting).	Section 5.6 Section 5.10 Section 5.14 and 5.15
Wildlife Conservation Plan for Migratory Shorebirds – 2015 (DoE, 2015c)	**Threats**: • None identified.	N/A
Wildlife Conservation Plan for Seabirds (CoA, 2020)	**Threats:** • Light pollution.	Section 5.6
Fish, sharks and rays		
Approved Conservation Advice for *Pristis zijsron* (green sawfish) (DEWHA, 2008b)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the green sawfish. **Threats**: • Habitat loss and degradation.	Section 5.14 and 5.15

Relevant plan/advice	Applicable threats or management advice	Addressed in EP section
Sawfish and River Sharks Multispecies Recovery Plan: (*Pristis pristis, Pristis zijsron*, *Pristis clavata*, *Glyphis glyphis* and *Glyphis garricki*) (DoE, 2015)		
Approved Conservation Advice for *Pristis clavata* (dwarf sawfish) (DEWHA, 2009) Sawfish and River Sharks Multispecies Recovery Plan: (*Pristis pristis, Pristis zijsron*, *Pristis clavata*, *Glyphis glyphis* and *Glyphis garricki*) (DoE, 2015)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the dwarf sawfish. **Threats**: • Habitat loss and degradation.	Section 5.14 and 5.15
Approved Conservation Advice for *Rhincodon typus* (whale shark) (TSSC, 2015c)	Conservation advice provides management actions that can be undertaken to ensure the conservation of the whale shark. **Threats**: • Habitat loss and degradation from pollution, changes to water regimes and invasive plants • Boat strike from large vessels and habitat disruption from mineral exploration, production and transportation • Marine debris.	Section 5.10 Section 5.12 Section 5.14 and 5.15
Recovery Plan for the Grey Nurse Shark (*Carcharias Taurus*) west coast population (DoE, 2014)	The recovery plan considers the conservation requirements of the grey nurse shark across its range and identifies the actions to be taken to ensure the species long-term viability.	N/A
Recovery Plan for the White Shark (*Carcharodon carcharias*) (DSEWPaC, 2013)	The overarching objective of this recovery plan is to assist the recovery of the white shark in the wild throughout its range in Australian waters. **Threats**: • None identified.	N/A
Marine mammals		
Approved Conservation Advice for *Balaenoptera borealis* (Sei Whale) (TSSC, 2015d)	The long-term recovery objective for blue whales is to minimise anthropogenic threats to allow for their conservation status to improve so that they can be removed from the EPBC Act threatened species list. **Threats**:	Section 5.3 and 5.4 Section 5.12

Relevant plan/advice	Applicable threats or management advice	Addressed in EP section
	• Noise interference: evaluate risk of noise impacts and, if required, appropriate mitigation measures are implemented • Vessel disturbance: evaluate risk of vessel strikes and, if required, appropriate mitigation measures are implemented.	
Approved Conservation Advice for *Balaenoptera physalus* (Fin Whale) (TSSC, 2015e)	Conservation advice provides threat abatement activities that can be undertaken to ensure the conservation of the fin whale. **Threats**: • Noise interference: evaluate risk of noise impacts to cetaceans and, if required, appropriate mitigation measures are implemented • Vessel disturbance: evaluate risk of vessel strikes and, if required, appropriate mitigation measures are implemented.	Section 5.3 and 5.4 Section 5.12
Conservation Management Plan for the Blue Whale, 2015-2025 (DoE, 2015b)	The long-term recovery objective for blue whales is to minimise anthropogenic threats to allow for their conservation status to improve so that they can be removed from the EPBC Act threatened species list. **Threats**: • Noise interference: evaluate risk of noise impacts and, if required, appropriate mitigation measures are implemented • Vessel disturbance: evaluate risk of vessel strikes and, if required, appropriate mitigation measures are implemented.	Section 5.3 and 5.4 Section 5.12
Conservation Advice for *Orcaella heinsohni* (Australian snubfin dolphin) (DCCEEW, 2025b)	Conservation advice provides threat abatement activities that can be undertaken to ensure the conservation of the Australian humpback dolphin. **Threats:** • Infrastructure/offshore development • Marine pollution • Vessel strike • Anthropogenic underwater noise (industrial and vessel noise).	Section 5.3 and 5.4 Section 5.10 Section 5.12
Conservation Advice for *Sousa sahulensis* (Australian humpback dolphin) (DCCEEW, 2025c)	Conservation advice provides threat abatement activities that can be undertaken to ensure the conservation of the Australian humpback dolphin. **Threats:** • Infrastructure/offshore development • Marine pollution • Vessel strike • Anthropogenic underwater noise (industrial and vessel noise).	Section 5.3 and 5.4 Section 5.10 Section 5.12

Relevant plan/advice	Applicable threats or management advice	Addressed in EP section
National Recovery Plan for the Southern Right Whale (DCCEEW, 2024o)	Recovery plan provides threat abatement activities that can be undertaken to ensure the conservation of the southern right whale. **Threats**: • Infrastructure/offshore development • Anthropogenic underwater noise • Vessel noise • Vessel strike.	Section 5.3 and 5.4 Section 5.12
Recovery plan for the Australian Sea Lion (*Neophoca cinereal*) (DSEWPaC, 2013a)	The long-term recovery objective for the Australian sea lion is to minimise anthropogenic threats to allow for their conservation status to improve so that they can be removed from the EPBC Act threatened species list. **Threats**: • Marine debris • Noise interference: evaluate risk of noise impacts and, if required, appropriate mitigation measures are implemented • Vessel disturbance: evaluate risk of vessel strikes and, if required, appropriate mitigation measures are implemented.	Section 5.3 and 5.4 Section 5.10 Section 5.12
Marine reptiles		
Recovery Plan for Marine Turtles in Australia, 2017-2027 (Commonwealth of Australia, 2017)	The long-term recovery objective for marine turtles is to minimise anthropogenic threats to allow for the conservation status of marine turtles to improve so that they can be removed from the EPBC Act Threatened species list. **Threats**: • Chemical and terrestrial discharge • Marine debris • Light pollution • Habitat modification • Vessel strike/disturbance • Noise interference.	Section 5.3 and 5.4 Section 5.6 Section 5.8 and 5.9 Section 5.10 Section 5.12 Section 5.14 and 5.15
Approved Conservation Advice for *Dermochelys coriacea* (Leatherback Turtle) (DEWHA, 2008c)	See above for Recovery Plan for Marine Turtles in Australia, 2017-2027.	As above.

Relevant plan/advice	Applicable threats or management advice	Addressed in EP section
Approved Conservation Advice for short-nosed sea snake (*Aipysurus apraefrontalis*) (DSEWPaC, 2011a).	Conservation advice provides management actions that can be undertaken to ensure the conservation of the short-nosed sea snake. **Threats**: • Degradation of reef habitat: no anthropogenic disturbance in areas where the short-nosed sea snake occurs.	Section 5.14 and 5.15

1.6.2 Western Australian Legislation

While the scope of this activity is limited to the Operational Areas within Australian Commonwealth waters, there are a number of State legislative requirements relevant to the potential impact of an oil spill in State jurisdiction. Table 1-4 summarises the principal, relevant WA legislative requirements.

Table 1-4: Relevant Western Australian legislation

Legislation	Scope	Application to activity	Administering authority
Aboriginal Heritage Act 1972	Protects and manages Aboriginal heritage by requiring approval for activities that may impact or cause harm.	Sites and objects protected under the Act may be present in the EMBA.	Department of Planning, Lands and Heritage (DPLH)
Maritime Archaeology Act 1973	Provides for the preservation of the remains of ships lost before 1900.	May be triggered in the event of impacts to a known or previously un-located shipwreck.	WA Museum
Pollution of Waters by Oil and Noxious Substances Act 1987	Provides for the protection of the sea from pollution by oil and other noxious substances. Gives effect to MARPOL in state waters.	Triggered in the event of vessels operating in state waters.	Department of Transport (DoT) Relevant Port Authority
Western Australian Marine Act 1982	Regulates navigation and shipping.	Triggered in the event of vessels operating in state waters.	DoT

1.6.3 Codes of Practice

The Australian Energy Producers (AEP) (formerly APPEA) Code of Environmental Practice (APPEA, 2008) is the most relevant Code of Practice for offshore petroleum activities. Specific requirements of the AEP Code of Environmental Practice include:

- Compliance with applicable laws, regulations, standards and guidelines and, in their absence, adopting the most practical means to prevent or minimise adverse environmental impacts.
- Ensuring that waste management practices minimise the potential impact on the environment. Practices are based on the prevention, minimisation, recycling, treatment and safe disposal of wastes.
- Providing adequate training to enable employees and contractors to adopt environmentally responsible work practices.
- Developing emergency plans and procedures so that incidents can be responded to in a timely and effective manner.
- Developing and maintaining management systems to identify, control and monitor risks.

VOGA is an AEP member and, when undertaking its projects and activities, adheres to the provisions of its Code of Environmental Practice.

Additionally, the International Finance Corporation (IFC) Environmental, Health, and Safety Guidelines for Offshore Oil and Gas Development (June 2015) are technical reference documents with general and industry-specific examples of Good International Industry Practice.

Both the AEP Code of Environmental Practice and the IFC Environmental, Health, and Safety Guidelines were key references in preparing for the environmental risk assessment process associated with this EP and in the development of the performance outcomes contained within it.

Section 2 Description of Activity

2.1 Background and Scope

VOGA currently operates the Wandoo Field within WA-14-L and has performed numerous infield development drilling campaigns. VOGA are planning near field exploration drilling to identify and confirm viable hydrocarbons and support further development of WA-14-L.

This section provides a description of the petroleum activity as required under Regulation 21(1) of the OPGGS(E)R. The description of the petroleum activity is presented in the following sections:

- MODU—includes positioning, and general (non-drilling) operation activities (Section 2.5)
- Drilling—includes drilling and contingency activities (Section 2.6)
- Formation evaluation—reservoir appraisal activities (Section 2.7)
- Well abandonment—plug and abandonment activities, including wellhead removal (Section 2.8)
- Summary of potential planned discharges (Section 2.9)
- Field support—includes use of support vessels, helicopters, and ROVs (Section 2.10).

There is no recovery of hydrocarbons associated with the exploration drilling activities, and as such no processing, transport, or third party end-use of hydrocarbons would occur as a result of the petroleum activity within the scope of this EP.

2.2 Location

Permit WA-14-L is situated approximately 80 km northwest of the port of Dampier with water depths ranging from approximately 50–60 m below Lowest Astronomical Tide (LAT). Indicative coordinates for the exploration prospects are provided in Table 2-1.

Table 2-1: Indicative geographical co-ordinates of the exploration prospects (GDA2020 Zone 50S)

Prospects	X (Easting)	Y (Northing)	Latitude	Longitude
Jinjulu	435158.7	7769128.6	20.174126078° S	116.379457185° E
Kullingal	437843.0	7769379.0	20.171952275° S	116.405154118° E
Mottlecah	439263.0	7773031.5	20.138993472° S	116.418865226° E
North Jurassic	438556.0	7777506.0	20.098539052° S	116.412251940° E
North West Jurassic	431796.0	7777285.0	20.100308831° S	116.347583269° E
North of Wandoo 1	441024.0	7777050.0	20.102736571° S	116.435844178° E
North of Wandoo 2	442025.0	7778592.0	20.088833157° S	116.445468311° E

2.2.1 Operational Area

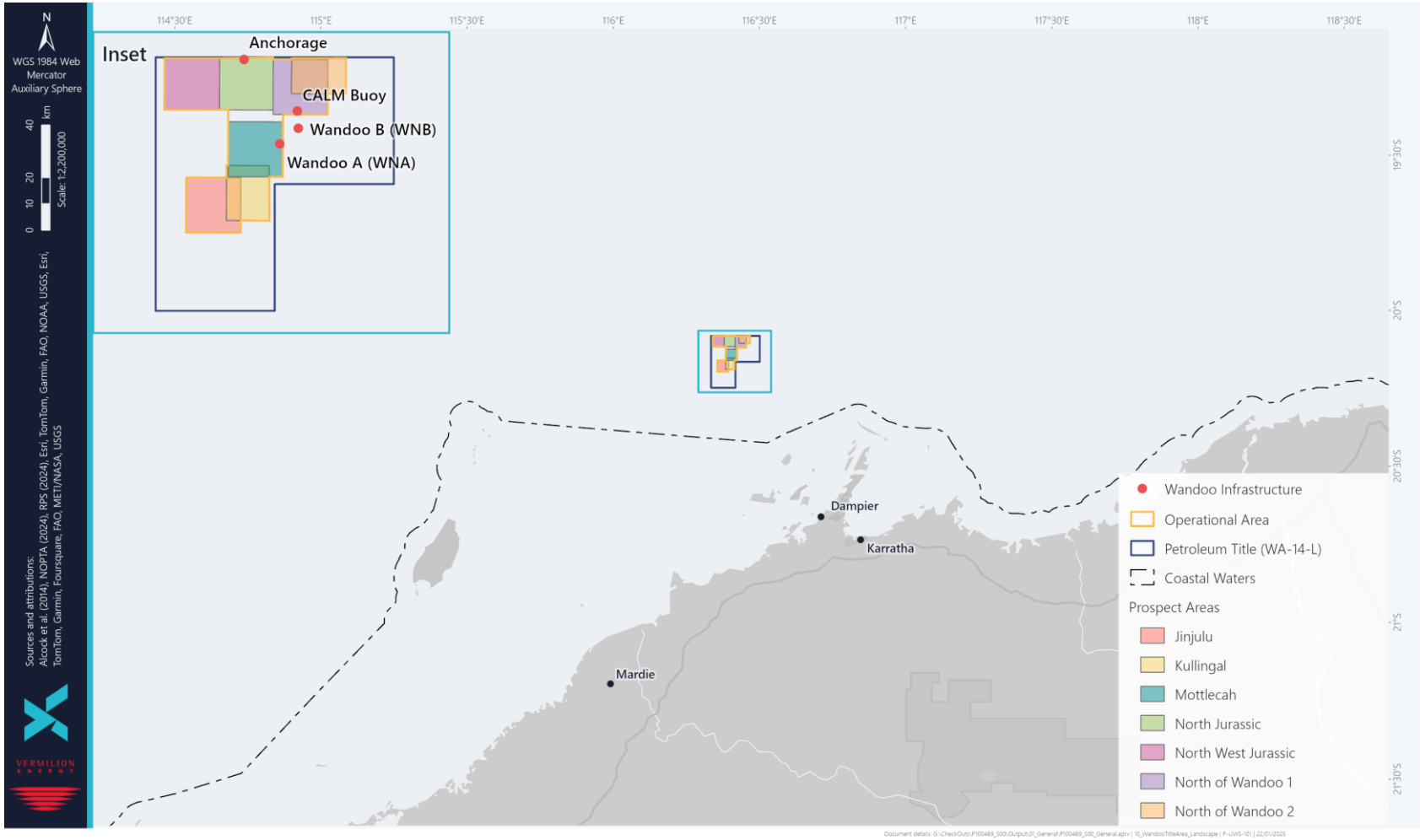
For the purposes of this EP, an Operational Area has been defined as a subset of Permit WA-14-L to encompass potential exploration prospects and allow environmental impact assessment. All planned activities (as described in Section 2) will occur within the Operational Area.

The Operational Area is defined based on 4 x 4 km squares around each prospect location. The Prospect Areas for North of Wandoo 2 and Kullingal are smaller than 4 x 4 km to ensure they are limited to the permit area. For the purposes of using the EPBC Act Protected Matters Search Tool (PMST), developing the existing environment description and some impact assessment, the Operational Area encompasses the Prospect Areas and additional areas between the sites to give a conservative total area. The proposed drilling Operational Area is shown in Figure 2-1.

The Operational Area encompasses a 500 m safety exclusion zone that will be requested around the MODU for the duration of activities.

The Operational Area has been developed to provide flexibility for well locations as planning progresses.

Figure 2-1: Operational Area



2.3 Activity Duration and Timing

The exploration drilling activities are planned to commence in 2026-2027 (pending MODU and vessel availability, regulatory approvals, or other VOGA project requirements). The activity is estimated to take ~15-20 days per well, which includes 2-3 days for MODU positioning, 10-15 days of drilling and 2 days for well plugging and abandonment.

This EP allows for up to 7 exploration wells to be drilled. The initial campaign will comprise one well. Subsequent campaigns (if any) may include up to 2 wells per campaign and will therefore take ~30-40 days. The total, maximum days expected for the exploration drilling activities is estimated to be 140 days over 5 years.

The above duration does not include vessel transit times, potential delays caused by ocean conditions, weather downtime, standby and equipment failure or other delays to the petroleum activity plan, as these factors are difficult to predict or quantify. Should additional time be required to complete the exploration drilling, VOGA will assess the situation in accordance with the VOGA Management of Change (MoC) Procedure (Section 8.5).

Activities covered within this EP will be conducted 24 hours per day and may occur 7 days a week at any time of the year.

2.4 Reservoir Oil Characterisation

Wandoo Crude, having lost the majority of its lighter fractions due to microbial biodegradation in the reservoir, is a 19.4° API crude, and is similar to other medium crude produced on the North West Shelf. It has a low pour point, virtually no paraffin wax and low asphaltene content. Modelling undertaken by RPS (RPS, 2024) shows that for Wandoo Crude, approximately 1.7% (by mass) of volatile hydrocarbons will evaporate within the first 12 hours. A further 10.2% of the oil is characterised as semi-volatile hydrocarbon compounds and will evaporate within the first 24 hours while an additional 33.1% represent the low volatiles and will typically evaporate over several days. A relatively high proportion (55%) of hydrocarbon compounds are persistent and are unlikely to evaporate but will decay over time.

A summary of reservoir oil specifications is contained in Table 2-2 and Table 2-3.

Table 2-2: Physical properties of Wandoo Crude

Properties	Wandoo Crude
Density (kg/m^3)	0.937 (at 16°C)
API	19.4
Dynamic viscosity [centipoise (cP)]	161 (at 25°C)
Pour point (°C)	-24
Hydrocarbon property category	Group IV
Hydrocarbon property classification	Persistent

Table 2-3: Boiling point ranges for Wandoo Crude

Characteristic oil type	Volatiles (%)	Semi-volatiles (%)	Low volatiles (%)	Residual (%)
Boiling point (°C)	< 180	180-265	265-380	> 380
	Non persistent			Persistent
Wandoo Crude	1.7	10.2	33.1	55

It is expected that any hydrocarbons encountered will have similar characteristics to the Wandoo Crude.

2.4.1 Geology and Reservoir Characteristics

The seabed in WA 14-L is approximately 50 m below mean sea level. The lithological sequence of interest in the prospects identified in WA 14-L is:

- **Tertiary age:** The upper ~300 m is highly uncompacted calcareous mudstone. No hydrocarbon indications have been seen on any wells drilled in the Field. No evidence of porosity in samples or logs.
- **Cretaceous age "Santonian"**: Claystone and calcareous claystone. These rocks are non-porous and form the main sealing formation in the area. Traces of siderite and sandstone occur in a few wells in the Field. No hydrocarbon indications have been seen on any wells drilled in the Field. No porosity or hydrocarbon shows observed.
- **Cretaceous age "Cenomanian"**: Claystone with minor silty claystone interbeds. No hydrocarbon indications have been seen on any wells drilled in the Field. No porosity or hydrocarbon shows observed.
- **Cretaceous age "Albian"**: Claystone with minor silty claystone interbeds. No hydrocarbon indications have been seen on any wells drilled in the Field. No porosity or hydrocarbon shows observed.
- **Cretaceous age "Barremian" (Upper Muderong Shale Formation):** 100% glauconitic claystone. It has calcareous cement with abundant interspersed glauconitic fine peletal glauconite. No porosity with minor patchy oil stains on cuttings is observed. This unit is the regional top seal for most hydrocarbon accumulations in the Carnarvon Basin, including the Wandoo Field.
- **Cretaceous age "*M. australis* Sandstone":** Comprised of an upper and lower unit, Unit A and Unit B, respectively. Unit A is a fine to medium-grained glauconitic sandstone (greensand), whilst Unit B is a fine to medium-grained massive sandstone. Together, Units A and B are the main producing formations of the Wandoo Field.
- **Cretaceous age "Barremian to Hauterivian" (Lower Muderong Shale Formation):** 100% glauconitic claystone. It has calcareous cement with abundant interspersed glauconitic fine peletal glauconite. No porosity with minor patchy oil stains on cuttings is observed. This unit is the base seal for the Wandoo Field.
- **Cretaceous age "Hauterivian" (Base Cretaceous Sandstone):** Arenaceous siltstone with minor glauconitic sandstone. Low to no porosity with no indication of hydrocarbons observed. A minor and geographically limited sandstone that is not present in most of the Dampier Sub-basin.

- **Jurassic age "Bathonian to Toarcian" (Athol Formation):** ~700 m thick claystone and siltstone with occasional, thin, interbedded sandstones. Hydrocarbons have been intersected locally in Wandoo-1 (3m gas sand), whilst Wandoo-2 (the only other Wandoo well to penetrate this unit) was absent of any hydrocarbon indications. The regional wells of Chamois-1, Oryx-1, Tusk-1 and Tusk-2 all intersected multiple thin sands containing oil, whilst other wells in the area have had indications of historical hydrocarbons (oil stains and higher-than-normal mud gas readings). Many wells in the area have shown no evidence of hydrocarbons in these sands despite adequate porosity. The claystone and siltstone which dominates the Athol formation is the top seal for the minor hydrocarbons found in the underlying Mungaroo, Brigadier and North Rankin formations.
- **Jurassic age "Sinemurian" (North Rankin Formation):** Massive sandstone with interbedded claystone and siltstone. Moderate to good porosity. Hydrocarbons (gas) intersected in and around the Reindeer gas field, whilst Cherring-1 intersected historical hydrocarbon shows. This formation thickens significantly further offshore and becomes one of the major reservoirs for fields along the Rankin Trend.
- **Triassic age "Rhaetian" (Brigadier Formation):** Interbedded varicoloured claystone and sandstone. Low to moderate porosity, with minor indications of historical hydrocarbons below the Reindeer gas field. Proportion of claystone vs sandstone is highly variable due to the fluvio-deltaic depositional environment, and the unit thickens into the centre of the Dampier Sub-basin. This unit is a minor reservoir for fields along the Rankin Trend.
- **Mid to Late Triassic (Mungaroo Formation):** Massive sandstone with interbedded claystone. Moderate to good porosity. Sub-economic oil accumulations intersected in Brocket-1, Tusk-1&2 and Okapi-1 wells, whilst indications of historical hydrocarbons evident at Gnu-1. Similarly to the North Rankin formation, the Mungaroo Formation significantly thickens further offshore, becoming one of the major reservoirs for the giant gas fields of Pluto, Gorgon and Goodwyn.

Currently, the only producing reservoir in the Operational Area is the *M. australis* Sandstone. The *M. australis* Sandstone is subdivided into an upper unit (the A sand) and lower unit (the B sand). The A sand is a fine-grained highly glauconitic sandstone (greensand) with a porosity of approximately 30% and permeability ranging from 50 to 3,000 millidarcy (mD) with reservoir characteristics that improve markedly with depth. The A sand is subdivided into 3 units, the uppermost being the A1 and the lowermost the A3. The B sand is a relatively clean, fine to medium-grained, quartzose sandstone of exceptional reservoir characteristics with porosities ranging from 35% to 40% and permeability ranging from 5 to 15 darcy (D). The B sand is also subdivided into a number of units based on reservoir quality (B1, B2, etc.).

Both the A and B sands are effectively unconsolidated. An important feature of the A sand is the presence of laterally discontinuous and coleratable siderite beds. These siderite beds are primarily concentrated in the A2 unit. Due to the unconsolidated nature of the sand and its high glauconite content, drill cuttings from the reservoir do not consist of rock chips and fragments that would otherwise be expected if a harder substrate or more consolidated substrata was drilled. Consequently, cuttings from this reservoir consist essentially of loose grains of sand and dispersed clays rather than rock fragments.

For reference, prior to the start of production, the Wandoo Field had a 22.1 m oil column overlain by an 18 m gas column at the crest of the Field. The oil is heavily biodegraded and

viscous (19.4 API gravity, 14.5 cP viscosity, -24°C pour point) and has a low Gas Oil Ratio (GOR) (99 standard cubic feet per barrel (scf/bbl)). The sulphur and wax contents are also low.

2.5 Mobile Offshore Drilling Unit

2.5.1 Positioning

The MODU that will be used by VOGA during its exploration campaigns will be a jack-up drilling rig. Jack-up rigs have 3 legs fabricated in a lattice structure terminating with a spud-can or foot at the base. Each spud-can is approximately 15 m in diameter and terminates in a point. Each of the 3 MODU legs is individually controlled. Each spud can is estimated to penetrate the seabed up to 3 m. The total seabed disturbance per location is estimated to be 575 m^2.

A MODU is typically towed between locations using one or 2 vessels, with its legs well clear of the seabed. Mobilisation of the MODU from either international or Australian territorial waters remains the responsibility of the contracted MODU Operator. Once the MODU is in waters adjacent to the Operational Area, the MODU is moved into the Operational Area in accordance with the rig move plan. Once in the Operational Area, the management of the MODU is within scope of this EP. The maximum tow speed is 5 knots. As it nears the planned drilling location the tow speed will be slowed to allow the MODU to be positioned over the desired location, at which time the move is stopped, and the legs are jacked down to contact the seabed.

After confirming the integrity of the seabed, the MODU hull will be jacked up to working height. The process of moving rig positioning once the MODU arrives inside the Operational Area takes up to 3 days.

At the completion of operations, the hull will be jacked down into the water and hull integrity tests are carried out while up to 2 vessels are connected to the hull (3 vessels will be connected if the MODU is being moved to a location alongside a Wandoo facility). The legs will then be raised clear of the seabed and the tow vessel/s will move the MODU to its next location. At the desired location the legs will be lowered, and process repeated.

2.5.2 Operations

The MODU is fitted with various equipment to support exploration drilling activities including:

- Power generation systems
- Fuel storage
- Cooling water and freshwater systems
- Drainage, effluent, and waste systems
- Primary and secondary (cuttings dryer etc.) solids control equipment.

Non-drilling activities occurring on the MODU include:

- Bunkering or bulk transfer of fuel, chemicals, and supplies
- Transfer of waste to supply vessels
- Helicopter operations

- Discharge of:
  - sewage, greywater, food waste
  - cooling water, reverse osmosis brine
  - deck drainage and bilge.

Example specifications for a MODU suitable for operating at Wandoo are provided in Table 2-4. The example MODU is typical of those used on the NWS. Any minor variations in jack up size are not considered to result in any material changes in environmental impact. The anticipated routine operational discharges from the MODU during exploration drilling activities are detailed in Section 2.9.

Table 2-4: Example MODU specifications

Rig type	Jack-up – Keppel FELS KFELS MOD V Super B Class or Friede & Goldman JU3000N designs or similar
Personnel on board	Up to 150 persons
Rig dimensions (typical)	Length ~75 to 85 m Breadth ~70 m Depth ~8 to 10 m 3 legs in triangular format up to 150 m long Leg Spacing Longitudinal centre ~37 to 45 m, transverse centre ~40 to 45 m Spud-cans ~15 m diameter x ~6 m high
Blowout preventer system	Manufactured and maintained to API standards and meeting VOGA well construction standards. Minimum specification 5,000 psi working pressure with 3 rams and one annular preventer with redundant control systems. Blowout Preventer (BOP) control system does not vent fluid to the environment.
Fuel volumes on site	Typical - ±850 m^3
Fuel consumption	Typical – 12 to 18 m^3/day
Fuel transfer hose	Typical – 3” to 4” flexible hose fitted with dry-break couplings
Cranes	Typical – SeaTrax fitted with 36 m boom; Main Block maximum load 50 T at 10.5 m radius and 15 T at 36 m radius; Whip Line 15 T at 36 m radius; hook load indicator; audible and visible alarms; automatic brake; crown saver limit switch.
Method of crew change	Helicopter from Dampier

It is expected the MODU will operate with up to 150 persons on board (POB). Estimates of sewage and grey water volumes are ~0.04–0.45 m^3 per person per day, and estimates of putrescible food waste are in the order of ~1–2 kg per person per day (NERA, 2017). Based on an indicative 150 POB, this gives an estimated discharge of sewage and greywater of up to ~63 m^3/day and ~280 kg/day for food waste from the MODU.

Several different materials will be transferred from support vessels to the MODU for the exploration drilling campaign. For example, cement, barite, and bentonite are transported as dry bulk, and are pneumatically blown from the support vessels to the MODU storage tanks using compressed air. The MODU dry bulk storage tanks vent excess compressed air to atmosphere

and this venting process also discharges small amounts of solids. Based upon previous programs it is estimated that during each bulk transfer a dry bulk loss in the order of ~0.005% is expected to be recorded. Based on an estimated storage capacity for bulk cement, barite, and bentonite on the MODU, this equates to <0.05 m^3 of solids discharged for the entire exploration program.

2.6 Drilling

2.6.1 Drilling Operations

Up to a maximum of 7 exploration wells will be drilled using a jack-up Mobile Offshore Drilling Unit (MODU, rig or drilling rig). Each individual exploration well will be drilled, evaluated and then plugged and abandoned. There will be no overlap in timings of drilling activities.

Drilling involves a number of steps, as detailed in this chapter, including:

- Movement of the drilling rig within the operational area, including entry to and exit from the area.
- Pinning the drilling rig on location, pre-loading the foundations and jacking up the MODU to the required working elevation.
- Drilling surface hole section, which is then cased in steel pipe and cemented in place. Drilling of the surface hole including the initial penetration will disturb approximately 0.67 m^2 per well.
- Installing a Blowout Preventer (BOP), after installation of surface casing, that is used in the unlikely event of an emergency to control well pressure and prevent a loss of well control release.
- Drilling and constructing the well to the target formation/s, with the installation of cemented casing strings as required, and then evaluating formations to determine if they contain and can produce hydrocarbons.
- Contingency activities such as sidetrack drilling, re-drilling sections and re-spudding of a well.
- General operations associated with the use of a drilling rig, vessels, helicopters and Remotely Operated Vehicles (ROVs) within the operational area, and
- Permanently plugging the well with cement barriers and removing all equipment from the seafloor.

Additional detail on these steps is provided in the following sections, with collated environmentally relevant details for drilling operations, including well evaluation to inform the impact and risk assessments. Additional specifications for a typical jack-up drilling rig are provided in Table 2-4.

2.6.2 Drilling Fluids and Cuttings Handling and Disposal

Drilling fluids (also referred to as drill muds) will be used during the drilling program to provide a range of functions, including:

- Control of formation pressures (i.e. providing hydrostatic head to prevent influxes and providing wellbore stability)

- Transport of drill cuttings out of the hole to the MODU
- Maintenance of drill bit and assembly (i.e. lubrication, cooling and support)
- Sealing of permeable formations to prevent formation invasion.

2.6.2.1 Drilling Fluid Program

Only Water-based Mud (WBM) will be used for the well/s.

The surface hole section will be drilled using seawater and Pre-Hydrated Gel (PHG) sweeps to clean the hole, and the hole will be displaced to PHG to provide stability for running the surface casing. This fluid will exit the well at the seabed while the hole is drilled, and the conductor casing is installed. As with the drilling fluids, cuttings for the conductor hole section will exit the wellbore at the seabed.

Once the surface casing is installed, and a closed circulating system is established, the remainder of the well will be drilled with WBM systems, as outlined in Table 2-8. WBM will be discharged from the MODU at the sea surface.

Cuttings for the remaining hole sections to Total Depth (TD) will be discharged at sea level after being removed from the WBM system through the solids control system. The solids control system comprises shale shakers, desanders and desilters.

Aqueous-based Lost Circulation Material (LCM) will be available to pump should downhole losses occur.

The selection of drilling fluids to be used during the drilling program is undertaken through an evaluation of the technical, safety and environmental attributes. A well-specific Drilling Fluid Program will be prepared by the drilling fluids contractor and endorsed by VOGA prior to spud.

The Drilling Fluid Program will contain details of the well data, drilling fluid-related risk assessment, load out list, logistics plan, execution plan and procedures. This Drilling Fluid Program will be implemented by the wellsite mud engineers (24 hr coverage).

The calculated volumes of drill cuttings to be generated and drilling and completion fluid solids discharged are outlined in Table 2-8.

2.6.2.2 Drill Fluid Additives

Seawater or drill water is the primary constituent of drilling fluids. Inert drilling fluid additives are added to the seawater or drill water to form a WBM. The WBM additives (by name/brand and volume) likely to be used in the drilling program, and their toxicity ratings, are not available at this stage. However, the key additives used in WBM are xanthum gum (viscosifier), bentonite (viscosifier) and barite (weighting agent), which are all inert substances (they have no toxicity, Section 2.6.2.3).

2.6.2.3 Drill Fluid Toxicity

In the absence of Australian standards (AS) regarding the suitability of drilling mud chemical additives, the Offshore Chemical Notification Scheme (OCNS) is used as a basis for selecting environmentally acceptable chemicals in the Australian offshore petroleum industry. The OCNS

manages chemical use and discharge by the United Kingdom (UK) and Netherlands offshore petroleum industries. The scheme is regulated in the UK by the Department of Energy and Climate Change using scientific and environmental advice from the UK's Centres for Environment, Fisheries and Aquaculture Science (CEFAS) and Marine Scotland.

The OCNS uses the Harmonised Mandatory Control Scheme (HMCS) developed through the Oslo-Paris (OSPAR) Convention 1992. This ranks chemical products according to Hazard Quotient (HQ), calculated using the Chemical Hazard and Risk Management (CHARM) model. The CHARM model requires the biodegradation, bioaccumulation and toxicity data of the product to be provided. Products not applicable to the CHARM model are assigned an OCNS grouping A – E, with 'A' having the greatest potential environmental hazard and 'E' having the least. Products that only contain substances termed PLONORs (Pose Little or No Risk to the environment) are given the OCNS 'E' grouping. Data used for the assessment includes toxicity, biodegradation and bioaccumulation. Refer to Section 8.3.6.3 for more information on these classifications.

VOGA will specify in the drilling fluid tender that only chemicals highly ranked under the OCNS rating system (i.e. 'Gold' or 'Silver' [CHARM] and 'E' or 'D' [non-CHARM], or equivalent) may be used in the drilling fluid design. Where a chemical has not been ranked under OCNS, the drilling fluids contractor will conduct a 'pseudo rating' using toxicity and environmental data for the individual substances of a product. The rating is conducted following the hazard assessment process outlined by CEFAS for the OCNS scheme. This will aim to understand the potential environmental impacts that may occur from discharge of the chemical. VOGA will provide final approval for use of chemicals with those that have been risk assessed by the contractor.

Chemical Substitution

Chemicals that are hazardous to the marine environment are subject to substitution warnings under the HMCS. The UK follows and applies the OSPAR harmonised pre-screening scheme and complies with Registration, Evaluation and Authorisation of Chemicals (REACH) recommendation to replace chemical substances identified as candidates for substitution. These substances are flagged with a substitution warning on the product template.

CEFAS recommends that during the selection of chemical products, operators consider the magnitude of their Risk Quotient (RQ) and the presence of hazardous substances and encourages operators to select products without a substitution warning. Chemicals that have a substitution warning will only be used if a justification for their use is provided, along with an assessment of the environmental impact from the chemical. VOGA will provide final approval for use of chemicals with a substitution warning.

Chemical Review Process

VOGA will review all chemicals nominated by the drilling fluids contractor against the Definitive Ranked Lists of Approved Products (current at the time) to ensure that only 'Gold' or 'Silver' [CHARM] and 'E' or 'D' [non-CHARM] rated chemicals are nominated and that none of the chemicals nominated have a substitution warning.

Where for technical reasons a chemical does not meet the requirements regarding its hazard rating or has a substitution warning in place, VOGA will review and assess the chemical proposed to ensure environmental risks are reduced to ALARP and acceptable levels. This will be

managed using VOGA's MoC Process (Section 8.5). The risk assessment will consider the chemical's end fate, volumes, concentrations and environmental impacts.

2.6.2.4 Fluids Disposal

Where applicable, drilling fluids will be carried over between hole sections.

At the end of the drilling program, any drilling fluid (mud and brine) remaining in the mud tanks will be discharged overboard. This volume will be minimised through careful mud management.

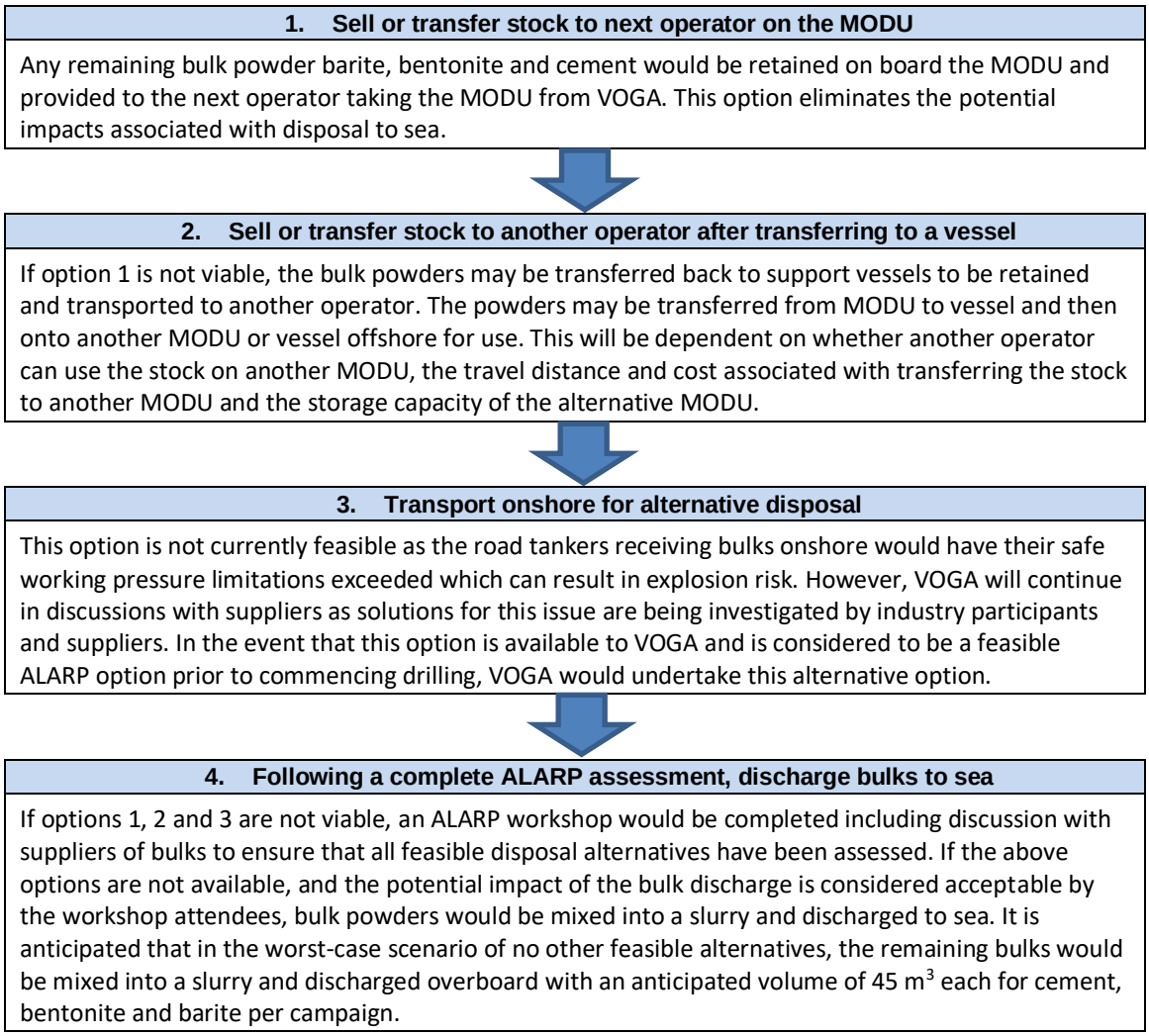
2.6.2.5 Chemical Disposal

Any dry, unopened sacks of chemicals or unopened drums/containers of liquid additives left over at the end of drilling will be left on board for the next operator to use or returned to shore. The decision on the end fate of leftover materials will be documented to ensure the final decision is environmentally acceptable. The decision list in order of preference is provided in Table 8-4.

2.6.2.6 Bulk Material Disposal

Following completion of drilling activities, leftover barite, bentonite and cement will be managed in accordance with a decision framework featuring options in order of preference (Figure 2-2). This decision will be finalised prior to commencing the drilling activity to ensure adequate preparedness activities have been completed. This also ensures that adequate time is given to consider the alternative for onshore disposal. VOGA have had discussions with suppliers that are working on a potential solution, however it is not currently available and may not be available by the time VOGA undertake this drilling activity.

Figure 2-2: Bulk material disposal options framework



2.6.3 Cementing Operations

Cementing operations will be undertaken to:

- Provide zonal isolation between different formations as required
- Maintain well integrity
- Provide structural support of the casing
- Set a temporary suspension plug or Plug and Abandon (P&A) plugs to abandon the well.

Cement will provide the main barrier for isolation of the wellbore from reservoir conditions whether the well is P&A or temporarily suspended. The final cement plan will be confirmed once a cement service provider has been selected. It is currently planned that wells will use Class G cement.

The notional cement program is outlined below:

- 13⅜" surface casing – the 13⅜" casing is planned to be cemented from section TD (± 350-400 m) to the base of the loss zone (+/- 150-200 m). Due to the likelihood of losses, cement

returns are unlikely to be able to be monitored at surface. It is planned that 50% excess cement will be pumped during this cement job to account for hole washout and losses that may occur during the cementation job.

- 9⅝" production casing (if run) – the 9⅝" casing is planned to be cemented back to 50 m above the surface casing shoe, with returns monitored at surface. Top of cement for this casing string may change through the well design phase. It is planned that 10-25% excess cement will be pumped during this cement job to account for hole washout and losses that may occur during the cementation job.

Abandonment cement plugs will be set as required to safely temporarily suspend or P&A the well. The final abandonment program will ensure moveable hydrocarbons (if identified while drilling) are isolated in line with a NOPSEMA-accepted Well Operations Management Plan (WOMP).

During cementing operations, surface cementing equipment and lines will need to be flushed, washed and cleaned with water to prevent hard setting. The residual cement and wash water will be discharged at the sea surface after each cement job.

Cement spacer in well returns and residual surface tank volumes will also be discharged to sea during cementing operations.

2.6.3.1 Cement Disposal

Cement will be discharged overboard as part of the cement program, with only required cement mixed to ensure minimal wastage. If no loss zone is encountered while drilling the surface hole section there may be some excess cement discharged directly at the seabed during the cementing of the surface casing string.

Indicative volumes of discharges from cementing operations are provided in Table 2-8.

At the end of the drilling program, bulk cement remaining on board will be disposed of in the same manner as barite and bentonite (Section 2.6.2.6).

2.6.4 Blowout Preventer Installation and Testing

A BOP is a mechanical device designed to seal off a well at surface when required. The system is made up of a number of different types of closing mechanisms consisting of:

- Rams - opposing pistons that move horizontally across the top of the well, creating a seal around the drill string, casing or completion tubing
- Blind shear rams - capable of shearing drill pipe and sealing the wellbore
- Annular preventers - deploy an elastomer donut-like device and used to close off the well around various sizes of pipe.

A BOP rated to the maximum anticipated wellhead pressure will be installed, and pressure tested prior to deployment and upon initial latch-up with the wellhead.

2.6.4.1 Initial Response to the Loss of Well Control

The following steps would initially be taken in response to a well kick:

- If secondary controls are required, an annular preventer or pipe ram is closed to prevent any further influx from the reservoir into the well if there is pipe in the hole (otherwise blind/shear rams are closed if there is no pipe in the hole).
- If there is pipe in the hole, the pipe rams will be closed.
- Lastly, the blind shear rams can shear the drill pipe (if required) and seal the well completely.

The BOP will only be removed once suitable barriers are in place and are tested. This will occur:

- After setting the cements plugs in the well, if the well is abandoned
- For any unplanned BOP maintenance or weather suspension reasons.

The BOP design is based on API standards, best practice and anticipated formation pressures. This is discussed in detail in the WOMP.

2.6.5 Contingency Activities

In the event of technical or operational issues during the drilling activity, contingency activities may be required. The activities are not expected to cause additional risks or impacts but may generate additional volumes of drilling fluids, cuttings, cement or seabed disturbance.

Indicative volumes of discharges from contingency operations are provided in Table 2-8.

2.6.5.1 Well Re-spud

If technical or operational issues are encountered while drilling, such as a failure to meet installation criteria, a well re-spud may be required. This activity would not involve moving the rig legs. The cantilever may be moved to a new position before drilling is recommenced. A well re-spud would result in an increase in the volume of cuttings and cement generated.

2.6.5.2 Sidetrack

A sidetrack is an alternative to a well re-spud, which involves drilling a secondary wellbore away from the primary wellbore. This may be done to avoid an unusable section of the primary wellbore, or if it is otherwise inaccessible. A sidetrack would be expected to result in an increase of cuttings generated and potentially cement discharges.

2.6.5.3 Well Suspension

Well suspension involves the application of suitable barriers, to suspend the well. Well suspension activities would be undertaken in accordance with the NOPSEMA-accepted WOMP. In some cases, the BOP may be left in place. Well suspension may be required in the instance of extreme weather events. The process of a planned removal of the BOP's and riser would result in the riser being displaced with seawater prior to disconnection and therefore no planned discharge of drilling fluids and cuttings.

2.6.5.4 Cementing Operations

Additional cementing operations may be required as a contingency activity due to unplanned events (e.g. kick-off plugs, failed formation integrity test, lost circulation remediation). The

discharges are expected to be no different from those described in cementing operations (Section 2.6.3).

2.6.5.5 Response to a Loss of Well Control

The nature of the Loss of Well Control (LoWC) leading to a hydrocarbon release will determine the type of source control activities required and the duration of the response. Source control activities evaluated for these prospects include:

- Containment
- Relief well drilling.

In the event of a blowout during drilling, reservoir modelling completed by VOGA (2024) indicates that the worst-case discharge would be released through the production hole section (no obstruction in the well) from a depth of 670 m with zero mechanical skin factor for a period of 35 days. By 35 days the reservoir conditions are unsuitable for flow to surface (i.e. the reservoir pressure is sub-hydrostatic). The oil and gas flow rates are provided in Table 2-5. The flow rates and volumes have been calculated by VOGA based on the following guidance:

- SPE Technical Report Calculation of Worst-Case Discharge (WCD) (SPE-174705-TR, 2016)
- NOPSEMA Information Paper Source control planning and procedures (N-04750-IP1979, 2024)
- NOPSEMA Guidance Note Oil Pollution Risk Management (N-04750-GN1488, 2021).

The global upstream petroleum industry has developed and continues to advance innovative technologies to respond to a well blowout.

Table 2-5: Predicted worst-case flow rates and volumes (VOGA, 2024)

Time frame/details	Flow rate	Release volume
Oil		
Initial oil flow rate	5,855 bbl/day	-
35-day oil average oil flow rate	4,794 bbl/day	-
Cumulative release volume over 35 days	-	0.167 MMbbl (167,800 bbl)
Gas		
Initial gas flow rate	0.512 MMscf/day	-
35-day average gas flow rate	0.427 MMscf/day	-
35-day gas cumulative release volume	-	14.955 MMscf
Water		
Initial water flow rate	N/A – no water released	
35-day average water flow rate	N/A – no water released	

Reservoir conditions, well parameters and fluid properties chosen for the WCD modelling represent the most likely to flow during blow out conditions for all exploration opportunities, thus the WCD modelling is appropriate for all considered prospects.

VOGA has a contract in place with a well control service provider (Wild Well Control) that allows it to access personnel and equipment to respond to a well control response. VOGA also has a

contract in place with Oil Spill Response Limited (OSRL) and a contract with the Australian Marine Oil Spill Centre (AMOSC) for hydrocarbon spill response resources that allows VOGA to access personnel and equipment to respond to a hydrocarbon spill.

Capping and Containment

A capping stack is a piece of equipment that can be placed over a blown out well and act as a cap. The purpose is to prevent the flow of hydrocarbons to the environment and thus establish a barrier to the flow of hydrocarbons to the ocean.

For this activity, a subsea capping and containment approach is not feasible because these systems are designed for subsea wellhead applications and therefore not suitable for jack-up MODU surface stack systems (which will be used for this activity). A surface wellhead capping stack is theoretically feasible however requires installation from the MODU, which is generally evacuated in the case of a loss of well control.

Relief Well

A relief well is a longer-term response option to stop uncontrolled flow from a well (i.e. 'kill' a well) and to permanently abandon the well. A relief well is drilled to intersect the well that is flowing out of control to provide a conduit to pump high density fluid into the well, and thus stop well flow. VOGA will execute its Relief Well Plan (RWP).

Relief Well Planning

A relief well requires the mobilisation of a suitable MODU and the drilling of an interception well through which the failed well can be killed and made safe.

The scope of activities involved with drilling a relief well is the same as drilling a standard well, though it would be a highly deviated well due to the need to drill from outside a safety zone. VOGA will prepare a RWP as part of the Source Control Emergency Plan (SCERP) for each well to be drilled under this EP. This plan/s will:

- Describe industry guidelines relevant to relief well drilling
- Describe the process in place to monitor for and rapidly source a suitable MODU
- Provide a proposed relief well location and alternate location and trajectories for well interception
- Provide a relief well casing design
- Provide a relief well drilling program and schedule
- Provide a list of long lead equipment and sourcing arrangements if not in stock.

Relief Well Rig Specification and Provision for Procurement

The selection of a suitable MODU to undertake relief well activities will be based on the closest available unit that meets the criteria listed in Table 2-4. Given the water depth in the vicinity of the proposed well locations (50-60 m), it is assumed only jack-up MODUs would be capable of undertaking the activities. Suitable jack-up MODUs working within the region will be identified prior to the planned drilling window for any well drilled under this EP.

Any relief well schedule will be driven largely by the rig mobilisation period. It is assumed that the most likely location of a jack-up MODU for drilling the relief well would be from Australia or South East Asia, which is approximately 10-14 days mobilisation time away from the Operations Area. It is expected that any ongoing operations can be safely suspended and the relief well MODU can be mobilised to the Operations Area location within the timeframe for the Safety Case Revision to be developed and accepted by NOPSEMA, assumed to be 50 days. The availability of suitable MODUs will continue to be monitored and their status updated within the RWP on a monthly basis to ensure any assumptions on the timely execution of relief well remain valid.

Relief Well Project Schedule

The process associated with planning and drilling of a relief well, if required, is estimated to take 78 days. Table 2-6 estimates the timing for each high level phase.

Table 2-6: Relief well schedule

Task activities	Duration (in days)
Event reported – begin mobilisation of rig for relief well drilling.	1
The following three tasks being completed simultaneously: • Well design and engineering completed – 30 days • Relief well rig onsite (via NWS or SE Asia) – 35 days • Regulatory submissions and approvals – 50 days.	50
Spud and drill relief well to intersect wellbore and bottom kill well to control source	27
Total duration	**78 days**

AEP Mutual Assistance Agreement

The Australian Energy Producers (AEP) developed the Memorandum of Understanding for Mutual Assistance (known as the Mutual Assistance Agreement, MAA) that facilitates the transfer of a MODU between operations in the event of a drilling emergency that requires a relief well to be drilled.

VOGA has signed up to the MAA.

2.7 Formation Evaluation

Formation evaluation involves the collection of data on the well and surrounding formation. Downhole formation evaluation will be carried out via Logging While Drilling (LWD)/ Measurement While Drilling (MWD) and wireline logging, which may include Vertical Seismic Profiling (VSP). No conventional coring is planned.

Radioactive sources used in downhole tools for logging purposes will be managed in accordance with the MODU Safety Case so that occupational health and safety risks to people are managed to an acceptable and ALARP level.

Well testing (flaring) is not part of this drilling and completions activity, so is not addressed further.

Further details on these well evaluation activities are provided below.

2.7.1 Measure/Logging While Drilling

As part of the drilling operation, the drilling bottom hole assembly (BHA) will incorporate MWD and LWD sensors. The MWD tools will provide a directional survey log of the wellbore, plus key drilling dynamics parameters while drilling.

The LWD tools will be utilised to gather key geological parameters while drilling to inform progress and anticipate upcoming intervals for logging operations.

MWD/LWD logs may include, but are not limited to:

- Direction survey
- Pressure, temperature and vibration
- Resistivity, gamma ray
- Neutron and density
- Sonic response.

MWD and LWD are used to provide real-time data from inside the well to the rig operators, which is important for exploring the petroleum formation as well as maintaining well control. These techniques do not generate noise or discharges in the marine environment.

2.7.2 Wireline Logging

Conventional wireline logging operations will be conducted in hole sections with potential reservoir units if feasible. The objectives of wireline logging are to gather more detailed reservoir information than is available via LWD, carry out sampling of the target, and improve depth control of seismic for future planning. Wireline logs may include, but are not limited to:

- Quad combo (resistivity, gamma ray, neutron, density)
- Image log and dipole sonic
- Formation pressure testing and fluid sampling
- Nuclear magnetic resonance
- Rotary and percussion sidewall cores
- Cased hole - cement evaluation.

The primary objective of the cased hole logging program will be to acquire cement bond logs to confirm wellbore isolation and cement integrity. As a contingency, further logs may be conducted in the cased hole sections resulting from tool failures in the open hole logging operations.

2.7.3 Vertical Seismic Profiling

As a subset of the wireline logging operation, VOGA intends to conduct zero offset VSP. The VSP will enable a high-resolution 2D image of the well and surrounding area to be obtained and

improve tie-in to seismic survey data for the area. The sound source will be held over the side of the MODU by the crane. The notional VSP details are as outlined in Table 2-7.

Table 2-7: Notional VSP details

Parameter	Details
Number of airguns	4
Sound source volume	150 cubic inches (cui) (for a total of 600 cui)
Pressure	2,000 psi
Number of shots	150
Source effort	13.8 Bar-m
Duration	4 hours active acquisition time within the total VSP program
Depth below sea level	4 m

2.8 Well Abandonment

Once the exploration drilling activities are complete, the exploration wells will be permanently plugged and abandoned in accordance with the requirements of Section 572 of the OPGGS Act and the NOPSEMA-accepted WOMP. During plug and abandonment, the casing string will be cut below seabed level and the seabed left clear of any casing. Well plug and abandonment will take up to 2 days per well.

2.9 Summary of Discharges

A summary of indicative discharges associated with the drilling activities for the proposed exploration wells are provided in Table 2-8.

Table 2-8: Summary of planned and contingent discharges (per well)

Discharge type	Indicative volume (m^3)	Fluid discharge location
Drilling fluids and cuttings		
Surface hole – fluids (Seawater and bentonite sweeps)	14,000 m^3	Seabed
Surface hole – cuttings	55 m^3	Seabed
Intermediate (if drilled) and production hole – fluids (WBM)	475 m^3	Surface
Intermediate (if drilled) and production hole – cuttings	100 m^3	Surface
Cementing operations		
Cement slurry (riserless/riser in place)	5 m^3	Seabed
Spacer fluids (riserless/riser in place)	8 m^3	Seabed
Residual cement (line flushing)	8 m^3	Surface
Blowout preventer installation and function testing		
BOP fluid (per function test)	No discharge	N/A
BOP fluid (per pressure test)	No discharge	N/A
Contingency activities		
Cuttings – well re-spud (riserless/riser in place)	55 m^3	Seabed
Surface hole – fluids (seawater and bentonite sweeps)	14,000 m^3	Seabed
Surface hole – cuttings	55 m^3	Seabed
Intermediate (if drilled) and production hole – fluids (WBM)	475 m^3	Surface
Intermediate (if drilled) and production hole – cuttings	100 m^3	Surface
Cement slurry (riserless/riser in place)	5 m^3	Seabed
Spacer fluids (riserless/riser in place)	8 m^3	Seabed
Residual cement (line flushing)	8 m^3	Surface
Well Abandonment		
Contaminated cement	No discharge	N/A
Wellbore content	No discharge	N/A
Metal swarf, cement cuttings, grit, flocculant (wellhead removal)	No discharge	N/A

2.10 Support Operations

2.10.1 Support Vessels

Two Anchor Handling Transport Supply (AHTS) support vessels are typically contracted for the duration of each campaign. A third vessel of similar or lesser specifications may also be used to provide additional logistical support. The maximum number of vessels in the Operational Area at one time is 3, in addition to the MODU. The general specifications for AHTS vessels suitable for supporting exploration operations at Wandoo are provided in Table 2-9.

Table 2-9: General AHTS vessel specifications

Vessel type	Dynamic positioned AHTS
Personnel on board	Typical crew 15 persons per vessel
AHTS dimensions (typical)	Length ± 95 m Breadth ± 25 m Draft ± 8.7 m
Main engines	23,000 bhp
Fuel volumes on site	Up to ± 2,325 m^3 (cargo fuel) ± 290 m^3 (fuel) Largest single tank size 300 m^3
Fuel consumption	Standby in field ± 6.0 m^3/day Economical speed ± 13.0 m^3/day Maximum speed ± 50 m^3/day
One-way voyage to or from Dampier	Economical speed ± 4½ hours Maximum speed ± 3½ hours

The AHTS vessels contracted to support the MODU operations will provide the following services under the scope of this EP:

- Tow the MODU onto and off location, including positioning it within the Operational Area
- Transfer of supplies to the MODU whilst on location in the Operational Area (including food, water, bulk materials, hardware, drilling mud material and diesel fuel)
- On location support duties, including maintaining watch of surrounding AHTS activity
- Emergency response, including rescue
- On-site oil spill response support.

The AHTS vessels will also provide the following services during the campaigns:

- Tow the MODU to and from waters adjacent to the Operational Area
- Transport of supplies between Dampier and the Operational Area
- Oil spill response support within the Hydrocarbon Area (Section 3.1.1).

Vessel operations within Australian Commonwealth waters outside of the Operational Area are managed under the *Navigation Act 2012* as administered by the Australian Maritime Safety Authority (AMSA), and are therefore out of scope of this EP.

All AHTS vessels will be required, under contract, to comply with all State and Commonwealth legislation for the control of all sources of pollution and of discharges at sea and to comply with MARPOL 73/78.

Cargo will be transferred to or from the MODU using the MODU cranes. Bulk powdered mud products, liquid mud products and diesel will be transferred to the MODU using MODU supplied transfer hoses. Diesel fuel transfers from AHTS supply vessels to the MODU will take place approximately once a week during the period spent on location. All refuelling operations and cargo transfer activities will be conducted in strict accordance with company and industry requirements.

The anticipated routine operational discharges from the AHTS support vessels during exploration well activities are detailed in Table 5-31.

2.10.2 Helicopters

VOGA will contract specialist aviation service contractors to provide helicopter services to support exploration drilling campaigns. Helicopter services provide the following support services:

- Personnel and minor cargo transfers between Karratha and the MODU
- Medivac
- Emergency evacuation of the MODU
- Night standby duty, with the helicopter and flight crews capable of flying under instrument flight rules, i.e. capable of flying at night and during low cloud.

It is expected there will be approximately 6 to 7 helicopter flights to the MODU each week during exploration drilling activities.

Routine helicopter operations will be limited to daylight hours.

The Wandoo production operations helicopter will provide backup to the helicopter contracted for the MODU operations.

Helicopter refuelling on the MODU is not planned while it is jacked up on location in the Operational Area.

Crew changes will occur via helicopter. Helicopter operations will be based out of the Karratha Airport. Personnel will travel between Perth and Karratha on commercial fixed wing aircraft.

Aviation activities are managed under the *Civil Aviation Act 1988* and Civil Aviation Regulation 1998 as administered by the Australian Civil Aviation Safety Authority (CASA), and are therefore out of scope of this EP.

2.10.3 Remotely Operated Vehicles

Underwater ROVs will be deployed and controlled from either the MODU or support vessel to support or undertake:

- Pre- or post-activity site surveys
- Mooring/anchoring placement
- Equipment deployment, monitoring, or retrieval
- Tool deployment and operation.

ROVs are generally equipped with a video camera and lighting. ROVs are also used to deploy specialist tooling and equipment. ROVs are closed systems, such that hydraulic fluids are circulated to move components, but these are not released to the environment.

ROVs will typically be stored on the deck of the vessels and/or MODU, but may be wet parked between activities, resulting in a temporary disturbance to a small area of the seabed. The footprint of the ROV is likely to be no bigger than 1.7 m^2.

Section 3 Description of the Environment

3.1 Overview

The OPPGGS(E)R define 'environment' as the ecosystems and their constituent parts, natural and physical resources, qualities and characteristics or areas, the heritage value of places and includes social, economic and cultural features of those matters. In accordance with the Regulations, the Description of the Environment describes the ecological and social components of the environment relevant to the activity and achieves the following:

- Provides adequate information about the Environment that May Be Affected (EMBA) by the activity in sufficient detail to inform the evaluation of environmental impacts and risks. This includes the EMBA by planned components of the activities, and the area that may be exposed during unplanned events such as a hydrocarbon spill.
- Adequately defines the environment that may be exposed to hydrocarbons in the event of a significant incident and the geographic extent of response and monitoring activities.
- Provides sufficient detail regarding relevant threatened or migratory species and their defined biologically important areas (BIA) and/or habitat critical for species survival.
- Identifies all values and sensitivities (if any) within the environment including matters protected under Part 3 of the EPBC Act.
- Enables relevant persons and members of the public to understand the environmental values and sensitivities that may be affected by the activity.

Environmental hazards have the potential to result in impacts or risks to environmental receptors, if they are present within the spatial or temporal boundaries of the environmental hazard. Receptors are defined as any component of the environment that may be affected by the proposed activities.

By using the defined Project Areas below (Section 3.1.1), it is possible to identify receptors which may typically be impacted, depending on behaviour. The details of receptors within the existing environment of each Project Area provided in this section is sufficient to undertake the impact assessment.

3.1.1 Project Areas

Project Areas are the different areas defined for this EP as areas of potential hazard or exposure to receptors. The existing environment within the Project Areas are described in this section. The nature and scale of the information provided in the description of the environment depends on the potential environmental hazards which may occur within that Project Area, and their scope for exposure to affected receptors.

For this EP, the following Project Areas have been defined:

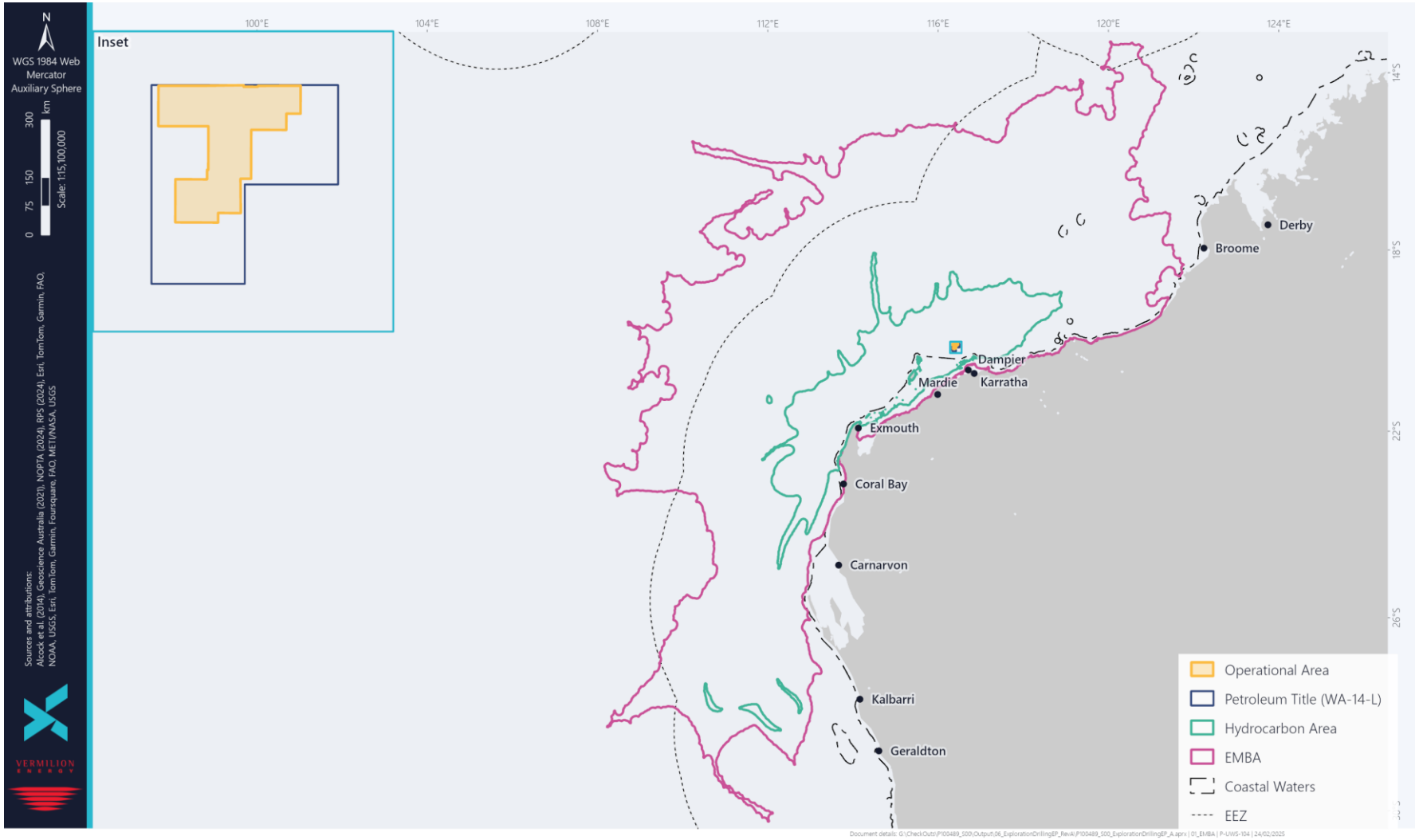
- **Operational Area -** The Operational Area (Section 2.2.1) is within Permit WA-14-L, which is located in Commonwealth waters in the Carnarvon Basin off the northwest coast of Western

Australia (WA), approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island.

- **Hydrocarbon Area** - The Hydrocarbon Area (Figure 3-1) has been defined to include the worst-case extent of predicted hydrocarbon exposure from planned and unplanned activities at exposure values that may have ecological impacts. The Hydrocarbon Area has been defined based on the combined outcomes of stochastic modelling for the loss of well control (LOWC) scenario (i.e. cumulative extent of a total of 100 model simulations per season) using moderate exposure values for each of the modelled oil components (10 g/m^2 floating, 50 ppb dissolved, 100 ppb entrained, 100 g/m^2 shoreline). These are the threshold levels anticipated to result in behavioural changes and sub-lethal and lethal effects to biota, and includes all probabilities of exposure.
- **EMBA** - The EMBA (Figure 3-1) for the Wandoo Field exploration drilling activities has been defined by a spatial area within which a change to the ambient environmental conditions may occur as a result of planned or unplanned activities. It is noted that changes in ambient conditions, as defined for the EMBA, does not imply that an adverse impact will occur. The EMBA for exploration drilling activities within the Wandoo field extends from Eighty Mile Beach, south of Broome, north to approximately 340 km south of the Indonesian island of Sumba and south to approximately 100 km east of the Abrolhos Islands off the coast of Geraldton.

  The EMBA is defined based on the combined outcomes of stochastic modelling for the LOWC scenario (i.e. cumulative extent of a total of 100 model simulations per season) using low exposure values for each of the modelled oil components (1 g/m^2 floating, 10 ppb dissolved, 10 ppb entrained, 10 g/m^2 shoreline). These threshold levels are used to establish the range of socio-economic effects and establish planning area for scientific monitoring based on potential for exceedance of water quality triggers.

Figure 3-1: Environment that May be Affected and Hydrocarbon Area



3.1.2 Relevant Receptors

Protected matters in the Project Areas were determined using the EPBC Act PMST (reports provided in Appendix C). For each receptor or receptor group known to occur within the defined Project Areas, their presence/absence is identified in Table 3-1. This, combined with the understanding of how each receptor is affected by environmental hazards, guides the nature and scale of information provided throughout Section 3.

Table 3-1: Receptor presence or absence within Project Areas

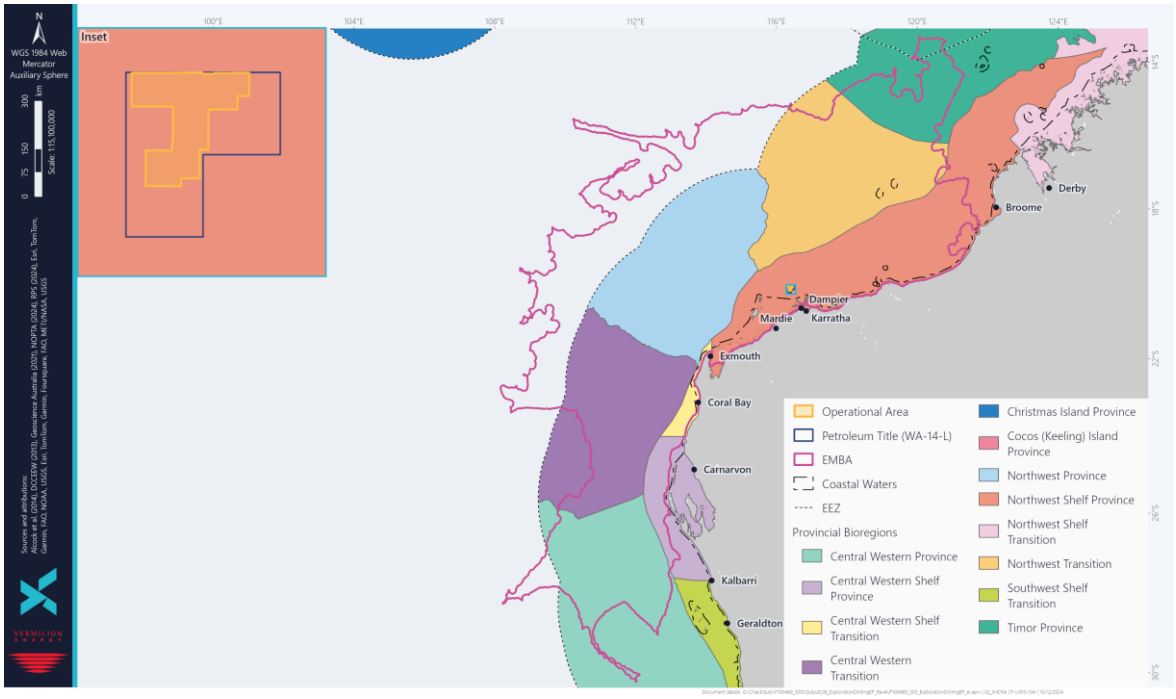
Receptor group	Operational Area	Hydrocarbon Area	EMBA
Physical environment	• climate • ambient water quality • ambient sediment quality • ambient air quality • ambient noise • ambient light.	• climate • ambient water quality • ambient sediment quality • ambient air quality • ambient noise • ambient light.	• climate • ambient water quality • ambient sediment quality • ambient air quality • ambient noise • ambient light.
Key benthic habitats	• subtidal soft sediment and benthic fauna.	• subtidal soft sediment and benthic fauna • corals • seagrasses • macroalgae.	• subtidal soft sediment and benthic fauna • corals • seagrasses • macroalgae.
Key coastal communities	• None	• mangroves • sandy beaches • rocky shorelines/ intertidal reef platforms • intertidal beaches/mudflats.	• mangroves • sandy beaches • rocky shorelines/ intertidal reef platforms • intertidal beaches/mudflats.
Key marine fauna	• benthic invertebrates • marine reptiles • birds • fish, sharks and rays • marine mammals.	• benthic invertebrates • marine reptiles • birds • fish, sharks and rays • marine mammals.	• benthic invertebrates • marine reptiles • birds • fish, sharks and rays • marine mammals.
Social and economic environment	• fisheries and aquaculture • commercial shipping • other users.	• fisheries and aquaculture • commercial shipping • defence areas • other users.	• fisheries and aquaculture • commercial shipping • defence areas • other users.

Receptor group	Operational Area	Hydrocarbon Area	EMBA
Protected and significant areas	• None	• underwater cultural heritage • Australian Marine Parks • State Marine Protected Areas • KEFs.	• World Heritage properties • National Heritage places • underwater cultural heritage • Australian Marine Parks • State Marine Protected Areas • KEFs.
First Nations	• None	• Marine Park Cultural Heritage Values.	• Registered Aboriginal Cultural Heritage sites • Marine Park Cultural Heritage Values.

3.2 Regional Context

The Operational Area and EMBA overlap 2 marine regions and 8 IMCRA provincial bioregions as displayed in Figure 3-2. Descriptions of these regions are provided in the sections below.

Figure 3-2: IMCRA provincial bioregions



3.2.1 Marine Regions

3.2.1.1 North-west Marine Region

The Operational Area lies within the North-west Marine Region (NWMR). The NWMR lies within Commonwealth waters from the border of WA and the Northern Territory (NT) to Kalbarri, covering approximately 1.07 million km^2 of tropical and sub-tropical waters. The region is characterised by shallow-water tropical marine ecosystems and high species richness, thought to be associated with the diversity of habitats available (DSEWPaC, 2012a).

Sixty-one percent of the seafloor within the region is continental slope, of which extensive terraces and plateaux make up a large proportion. A majority of shallow waters are focused adjacent to the Pilbara and Kimberly regions (~30% of the total region) with the narrowest shelf margin of the region and Australia located at Ningaloo Reef. A majority of the region is relatively shallow with over 50% having water depths of less than 500 m. The sections of the Argo and Cuvier plains which lie within the region make up 10% of its total area and are the deepest sections of the region reaching depths of almost 6,000 m (DEWHA, 2008).

3.2.1.2 South-west Marine Region

The EMBA also overlaps the South-west Marine Region (SWMR). The SWMR lies within Commonwealth waters and extends from the eastern end of Kangaroo Island, off the coast of South Australia, to Shark Bay in Western Australia, covering approximately 1.3 million km^2. The region is characterised by temperate waters off the south west of WA and subtropical waters along the southern coast, with high wave action throughout the region focused on the continental slope. By global standards, the SWMR is high in biodiversity with many species' endemic to the region (DSEWPaC, 2012b).

Dominant physical features of the region include a narrow continental shelf on the south west coast transitioning into a wider continental shelf along the Great Australian Bight. Water depths vary throughout the region with islands and steep and muddy continental slopes, including canyons, being a common feature. Deeper waters of the region are poorly understood and can extend to depths greater than 4,000 m (DSEWPaC, 2012b).

3.2.2 IMCRA Bioregion

The Integrated Marine and Coastal Regionalisation of Australia (IMCRA) is a biogeographic regionalisation of oceanic waters within Australia's Exclusive Economic Zone (EEZ). IMCRA further classifies Australia's marine regions into smaller scale bioregions based on fish, benthic habitat and oceanographic data at a scale that is useful for regional conservation planning and management (DEWHA 2008).

The Operational Area is located within the Northwest Shelf province. The EMBA overlaps a further 7 provincial bioregions:

- Timor province
- Northwest transition
- Northwest province
- Central Western Transition

- Central western shelf transition
- Central western shelf province
- Central western province.

3.2.2.1 North-west Shelf Province

The Operational Area is located within Northwest Shelf Province. The Northwest Shelf Province lies predominantly on the continental slope, extending from the North West Cape to Cape Bougainville, covering an area of 238,759 km^2. The width of the bioregion varies along its length from approximately 50 km at the Exmouth Gulf to more than 250 km off Cape Leveque. About half the bioregion has water depths between 50 and 100 m, with maximum depths reaching 200 m.

The bioregion is a dynamic oceanographic environment and is influenced by cyclonic storms, strong and internal tides and long period swell. Its waters derive from the Indonesian Throughflow and are warm, oligotrophic and circulate throughout the bioregion via branches of the South Equatorial and Eastern Gyral Currents.

Fish communities in the bioregion are diverse, comprising of both benthic and pelagic fish. Humpback whales migrate through the area with the Exmouth Gulf considered an important resting area, particularly for mothers and calves on their southern migration. Several important breeding sites for seabirds are located within the region (outside Commonwealth waters), including Eighty Mile Beach and the Montebello, Barrow and Lacepede islands.

Industries that utilise the resources found in bioregion include the petroleum industry, commercial fishers and shipping, with nationally significant ports of Dampier and Port Headland present (DEWHA 2008).

3.2.2.2 Timor Province

The Timor Province lies between Broome and Cape Bougainville, occupying approximately 15% of the North-west Marine Region and covering predominantly continental slope and abyss. Water depths range from approximately 200 m from near the shelf break to up to 5,920 m over the Argo Abyssal Plain. In addition to the Argo Abyssal Plain, the main geomorphic features within the region are the Ashmore Terrace, Scott Plateau, the Bowers Canyon and part of the Rowley Terrace.

The bioregion is dominated by the warm, oligotrophic waters of the Indonesian Throughflow. This region has a particularly pronounced thermocline in the water column and is associated with the generation of internal tides which is a significant oceanographic feature of this region. The variation in bathymetry together with the variety of geomorphic features in the province results in numerous distinct habitats and biological communities many of which are in close proximity to each other. The islands and reefs that lie within the bioregion are regarded as particular hotspots for biodiversity. Demersal fish communities of the bioregion have high endemism with 2 distinct communities identified (DEWHA, 2008).

3.2.2.3 Northwest Transition

The Northwest Transition Province covers an area of 184,424 km^2 and predominantly occurs on the continental slope (52%), with smaller areas in the north-west located on the Argo Abyssal

Plain and continental rise (DEWHA, 2008a). Water depths vary, generally ranging from 200 m depths at the shelf break to more than 1,000 m over the continental slope with a maximum depth of 5,980 m.

The seafloor topography of the bioregion is complex with a range of features including carbonate banks, submerged terraces, pinnacles, sand banks and reefs. The pinnacles and carbonate banks of the Joseph Bonaparte Gulf are distinctly different in morphology and character to other parts of the Region and are believed to support a high diversity of marine species.

Biological communities of the region are typical to that of Indo-west Pacific tropical flora and fauna. Marine environments include a range of soft bottom and hard substrate habitats. The Western Australian population of humpback whales mate and give birth in the inshore waters off the Kimberley. In addition, the Northwest Shelf Transition is important for commercial fisheries, defence, and the petroleum industry (DEWHA, 2008).

3.2.2.4 Northwest Province

The Northwest Province lies offshore between Exmouth and Port Headland, entirely on continental slope. The region covers an area of 178,651 km^2 with water depths ranging from 1,000–3,000 m.

The dominant geomorphic feature is the Exmouth Plateau. The Montebello Trough and Swan Canyon are also important features of the region. The Exmouth Plateau contains the steepest shelf break in the Marine Region along the Cape Range Region near Ningaloo Reef. Dominant surface flow of the region includes circulation and recirculation (via the South Equatorial Current) of the Indonesian Throughflow. As a result of the predominantly southward moving surface waters, waters consolidate along the narrow shelf break adjacent to Cape Range Peninsular to form the Leeuwin Current which is a significant feature for the bioregion and areas further south.

Canyons in the bioregion are thought to aid in the channelling of water onto the Exmouth Plateau and certainly into the shelf along Ningaloo Reef, which aids in enhancing localised biological production. The Northwest Province represents the beginning of a transition between tropical and temperate marine species with high endemism in demersal fish communities on the slope evident in this bioregion. Commercial fishing and petroleum are important industries in some parts of the bioregion (DEWHA, 2008).

3.2.2.5 Central Western Shelf Transition

Of all the provincial bioregions, the Central Western Shelf Transition is the smallest, covering an area of 9,698 km^2, located entirely on the continental shelf between the North West Cape and Coral Bay. The maximum water depth in the region is 100 m.

This bioregion is strongly influenced by the Leeuwin Current and Leeuwin Undercurrent interacting with the northward flowing Ningaloo Current. It lies within a significant biogeographic transition between tropical and temperate species. The bioregion is largely covered by the Ningaloo Marine Park and Ningaloo Reef. Ningaloo Reef is an area of high biodiversity with over 200 species of coral and more than 460 species of reef fish. Other fauna which may occupy the reef environments within the region include marine turtles, dugongs and dolphins with the potential for whale sharks and manta rays to occupy outer reef areas.

Commercial fishing and petroleum are important industries in some parts of the bioregion (DEWHA 2008).

3.2.2.6 Central Western Transition

The Central Western Transition Province is located between Shark Bay and North West Cape covering 162,891 km^2 of continental slope and abyss. Almost half of the region has water depths of more than 4,000 m, with maximum recorded water depths within the region of 5,330 m. As a result of the proximity of deep ocean areas to the continental slope and shelf, distinctive biological communities may have developed. The major geomorphic features of the bioregion are Carnarvon Terrace, Wallaby Saddle, the Cuvier Abyssal Plain and the Cloates and Cape Range Canyons.

The Leeuwin Current, flowing south along the slope, is the dominant oceanographic feature in the region. Interactions between the Leeuwin Current, Leeuwin Undercurrent and the nearshore Ningaloo Current facilitate vertical mixing of water layers and are thought to be linked with bursts in productivity (particularly during summer). This bioregion also lies within the biogeographic transition between tropical and temperate marine species. The level of endemism within demersal fish communities on the slope is less than that in bioregions further north. Major industries in the bioregion are commercial fishing and petroleum (DEWHA, 2008).

3.2.2.7 Central Western Shelf Province

The Central Western Shelf Province is located between Kalbarri and Coral Bay lying entirely on the continental shelf, covering an area of 50,516 km^2. Water levels in the region range from 0–100 m with the benthic environment being predominantly flat, comprising mainly sand with some mud and gravel. Width of the region varies along its length from less than 20 km from the shoreline to around 125 km in the vicinity of Shark Bay.

The major geomorphic feature of the region is Dirk Hartog Shelf. Other topographic features include a small area of reef and tidal sand banks near the entrance of shark bay and an area of banks and shoals offshore Kalbarri.

Major currents in the region include the Leeuwin Current, Ningaloo Current and the Capes Current with the circulation of the inner bay environment of Shark Bay being restricted by a complex network of sills and channels. This, along with limited fresh water flow and high evaporation rates leads to a hypersaline environment. Due to the shallowness of the region, the Leeuwin current and Shark Bay Outflow are likely to dominate the water column.

This bioregion also lies within the biogeographic transition between tropical and temperate marine species. Biological communities within Shark Bay have been well documented and the bay has been declared a World Heritage Area. It has a diversity of habitat areas including rocky shorelines, sandy plains and seagrass, in both high and low energy zones. The level of endemism within demersal fish communities on the slope is less than that in bioregions further north. Major industries in the bioregion Include commercial fishing (DEWHA, 2008).

3.2.2.8 Central Western Province

The Central Western Province covers an area of 268,460 km^2 of the continental slope and abyss between Shark Bay and Perth. It is characterised by narrow continental slope incised by numerous submarine canyons, including the Perth Canyon. Almost half the bioregion has water

depths of more than 4,000 m, with the maximum water depth in the bioregion recorded at 5,330 m.

The Leeuwin Current, flowing south along the slope, generates meso-scale eddies that form along the shelf break, detach from the Leeuwin Current and transport nutrients and plankton offshore. The level of endemism within demersal fish communities on the slope is less than in the bioregions further north. This bioregion is also within the biogeographic transition between tropical and temperate marine species. The major industries in the bioregion are commercial fishing and Defence training (DEWHA, 2008).

3.2.3 Outside of Australia's Exclusive Economic Zone

The EMBA extends outside of Australia's Exclusive Economic Zone (EEZ). The EEZ is located off the Western Australian coastline and extends from the territorial sea limit across the mainland of Australia's Indian Ocean Territories, to 200 nm offshore. The Australian EEZ shares boundaries with:

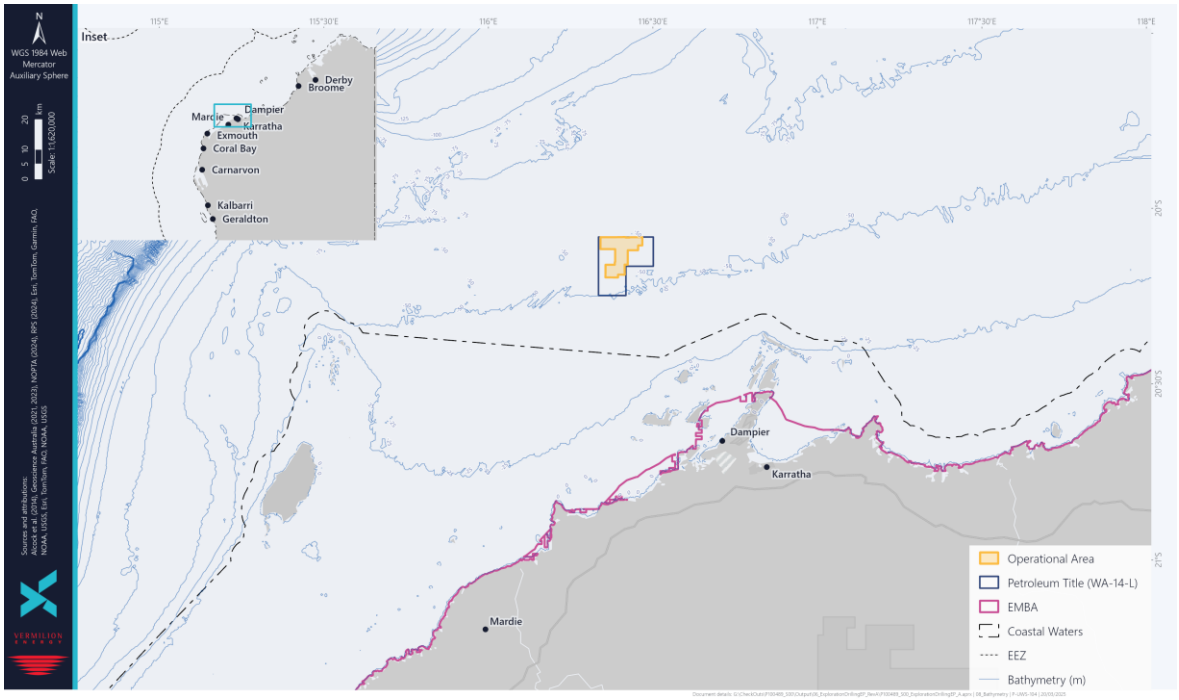
- International waters, which lie to the west and south of the WA section of EEZ. The United Nations Law of the Sea Convention (UNCLOS) manage international waters and is administered by the International Maritime Organisation (IMO).
- The Timor-Leste EEZ in the Timor Sea, which lies along the northern edge of the Australian EEZ. The national Petroleum Authority of Timor-Leste regulates this area on behalf of the Australian and Timor-Leste government.
- Indonesia to the north-west, of which the boundary is defined in accordance with the Perth Treaty, negotiated with the Republic of Indonesia.

The EMBA extends into international waters with a small section of the EMBA overlapping the Indonesian EEZ.

3.3 Physical Environment

Table 3-1 identifies that the physical environment includes receptors within the Operational Area, Hydrocarbon Area and EMBA that may be relevant to aspects of the exploration drilling activities. The Operational Area lies on the North West Shelf in waters approximately 50–60 m deep (Figure 3-3).

Figure 3-3: Seabed bathymetry



3.3.1 Climate

The climate of the Pilbara region of Western Australia is classified as arid tropical with two distinct seasons: a hot, wet summer (October to April) and a mild, dry winter (May to September) (Bureau of Meteorology, 2024).

Based on long-term climatic data from the nearest Bureau of Meteorology weather station at Karratha Airport (Station 004083), approximately 73 km south-south east of the Operational Area, the mean annual rainfall since 1972 is 288.5 millimeters (mm). The mean maximum temperatures range between 26.5°C in July and 36.2°C in December, and averages above 30°C for much of the year (Bureau of Meteorology 2024). Minimum temperatures range between 13.9°C in July and 26.9°C in January

Winds vary seasonally, with a tendency for westerly winds in summer and southerly winds in winter (Pearce et al., 2003). There are often distinct 'transition' periods between the summer and winter regimes, which are characterised by calmer periods. Rainfall is low and unpredictable, with most rainfall occurring between January and May, often associated with the passage of tropical cyclones (Pearce et al., 2003).

3.3.2 Ambient Water Quality

Marine water quality within the EMBA is expected to be representative of the typically pristine and high quality found in offshore WA waters (Wenziker et al., 2006; Worley, 2025). Variations to this state (e.g. increased turbidity) may occur in more coastal regions that are subject to large tidal ranges, terrestrial run-off or anthropocentric factors (i.e. ports, industrial discharges, etc.).

- Water quality surveys undertaken in the Wandoo Field in October 2024 showed a warm saline, low turbidity surface layer, with no evidence of thermoclines or upwelling/downwelling (Worley, 2025).
- Concentrations of total recoverable hydrocarbons, zinc, copper, suspended solids and ammonia were slightly higher next to the Wandoo Facility, but diluted rapidly within 70 m of the facility (Worley, 2025).

3.3.3 Ambient Sediment Quality

Several surveys have been undertaken within the vicinity of the Operational Area during the operating life of the Wandoo Facility. In addition to the Bowman Bishaw Gorham (BBG) (1996) baseline sediment survey, a post-commissioning sediment survey was undertaken by Sinclair Knight Merz (SKM) in 1996. BBG (1996) found the sediments were comprised of a mixture of fine, medium, coarse and very coarse sands. This is consistent with sediments found throughout the NWS Province where sediment is dominated by sand (Baker et al., 2008). Particle size data from the study undertaken by SKM in 1996 indicated that sediments are typically comprised of unconsolidated to coarse sands. This shift towards a coarser grain size is indicative of discharge received from drilling at Wandoo.

Sediment metal, petroleum hydrocarbon and Polycyclic Aromatic Hydrocarbon (PAH) levels were also tested during both studies (BBG, 1996; SKM, 1996). Sediment metal levels have increased since the baseline survey; however, they were within the trigger values outlined in the former ANZECC/ARMCANZ (2000) sediment quality guidelines which have since been revised in the Water Quality Guidelines (ANZG, 2018). These metal concentrations reflect background levels of the region (Long et al., 1995). Petroleum hydrocarbons and PAH levels were below detection limits in all samples collected during the surveys (BBG, 1996; SKM, 1996).

An additional baseline survey for the Wandoo Facility was undertaken in 2015 and in 2024 to assess changes that may have occurred since the original baseline and post-commissioning surveys undertaken in the 1990s (Worley, 2025). Hydrocarbons in sediments at all sites were below the LOR or below the available Sediment Quality Guideline for the highest level of protection in the former ANZECC/ARMCANZ (2000) guidelines. Sediment metal/metalloid concentrations at all sites were below the former respective trigger values, or where no guidelines existed lower or similar to previous studies with the exception of Barium. This was likely due to the presence of residual drilling muds (containing barium) at the time of the post-commissioning survey.

There was an overall increase in sediment metal concentrations compared to the baseline survey 20 years ago (BBG, 1996) however no trend has been identified in direction or distance from the Wandoo B (WNB) Platform. Furthermore, of the metals that have increased in sediments since the baseline survey, none are currently at concentrations exceeding the recommended guideline for the 99% species protection level.

In 2015 and 2024, sediment infauna abundance and species richness were significantly higher than during the baseline survey in 1996 and the post-commissioning survey in 1998.

3.3.4 Ambient Air Quality

The majority of the offshore NWS Province region is relatively remote and therefore air quality in the Operational Area is expected to be high. Anthropogenic sources (e.g. vessels, industry developments) would contribute to local variations in air quality. However, results of previous monitoring within the region suggest that the concentration of air quality parameters remains low. Measured levels of nitrogen dioxide and ozone during a Pilbara air quality study were found to be below the National Environment Protection Measure (NEPM) standards (DoE, 2004).

More recently, Chevron published results of air quality monitoring on Barrow Island (within the EMBA, 107 km south west of the Operational Area) which showed no values that exceeded the NEPM standards for nitrogen oxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), carbon monoxide (CO), hydrogen sulfide (H_2S) or aromatic hydrocarbons (BTEX) (Chevron Australia, 2022). Chevron's monitoring showed exceedances of PM10 levels (particulate matter less than 10 microns) around some facilities on the island, however these were attributed to localised unsealed road dust and regional events (Chevron Australia, 2022).

3.3.5 Ambient Noise

The Operational Area is relatively remote and therefore ambient noise levels are expected to be low. Ambient noise within the NWS Province region is expected to be dominated by natural physical (e.g. wind, waves, rain) and biological (e.g. echo-location and communication noises generated by cetaceans and fish) sources. Anthropogenic noise sources that are also likely to be experienced in the area include low-frequency noise from vessels.

3.3.6 Ambient Light

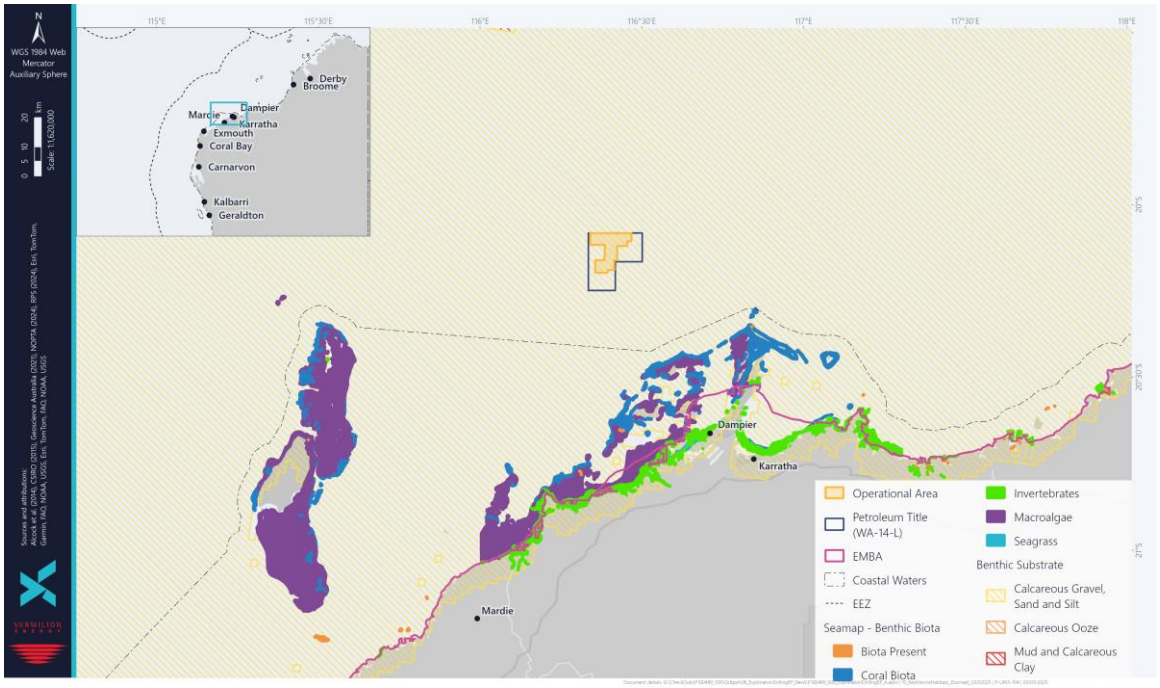
The Operational Area is relatively remote and therefore ambient light levels are expected to be low. Ambient light within the NWS Province region is expected to predominantly be from solar/lunar luminance. However, artificial light sources associated with anthropogenic activities also exist, including both permanent (e.g. onshore/offshore developments) and temporary (e.g. vessels) light sources.

3.4 Ecological Environment

3.4.1 Key Benthic Habitats

Table 3-1 identifies that key benthic habitats are relevant receptors within the Operational Area, Hydrocarbon Area and EMBA to aspects of the drilling activities. Four key marine habitats are described below. The description provides sufficient details to assess all impacts and risks to key marine habitats. Figure 3-4 shows benthic biota and benthic substrate in the vicinity of the Operational Area.

Figure 3-4: Key benthic habitats



3.4.1.1 Subtidal Soft Sediment and Benthic Fauna

Remote Operated Vehicle (ROV) surveys on the NWS, at similar water depths to those in the Operational Area, indicate the sea floor is comprised of fine silt/sand substrates (RPS, 2012 unpublished data). The sediments were variously bioturbated, however benthic communities were generally sparse with low densities of organisms (e.g. crustaceans, molluscs, and polychaetes). According to the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Marine Benthic Substrate Database (CSIRO, 2015), the sea floor sediment type within the Operational Area is calcareous gravel, sand and silt (Figure 3-4).

Unconsolidated sediments support diverse benthic fauna living both in the sediments (infauna) and on the sediment surface (epifauna). Infauna species consist predominantly of mobile burrowing species including molluscs, crustaceans (crabs, shrimps and smaller related species), polychaetes, sipunculid and platyhelminth worms, asteroids (sea stars), echinoids (sea urchins) and other small animals. Epifauna species include small crustaceans and molluscs, echinoderms and larger sessile organisms such as sponges, corals, sea whips and sea squirt (DEC, 2006).

Soft sediment habitats that support infauna are widespread in deeper offshore areas and in more protected environments throughout the region (CALM and MPRA, 2005; DEC, 2006). The sediments range from clays to silts and fine sands. The depths of the Argo Abyssal Plain support sparsely distributed sessile organisms such as filter-feeding and deposit-feeding species (DEWHA, 2008a). The spatial and temporal distribution and density of infauna depends not only on sediment composition but also on factors such as season, water depth, water temperature and wave-induced currents (Ward and Rainer, 1988; Rainer, 1991; Kinhill, 1997). Communities in shallower areas (less than 30 m deep) are likely to be dominated by sessile filter-feeding species such as sponges, sea pens and ascidians. Sediments in deeper water are typically finer (muddier) and the benthic community is dominated by benthic scavengers and deposit feeders including polychaete worms, crustaceans, molluscs and echinoderms (DEWHA, 2008a).

The sea floor of the deeper waters of the NWS is primarily a soft sediment habitat that can support scavengers, benthic filter feeders and epifauna communities (Brewer et al., 2007). Any areas of exposed hard substrate are likely to be colonised by deep water filter-feeding organisms, such as hydroids and sponges.

A baseline survey undertaken in 2024, using box coring samples, showed benthic infauna increases in species richness and abundance at sites further away from the Wandoo Facility, which may be influenced by sediment composition and particle size distribution with higher proportions of silt and clay at sites 500 m or more from the platform. Benthic infauna composition is considerably different from previous surveys with amphipods being the most abundant infauna group, in comparison to the 1996 survey which showed the most abundant taxon was crustaceans, polychaete was the most abundant taxon in the 1998 survey, and nematodes the most dominant group in 2015 survey (Worley, 2025).

3.4.1.2 Corals

No natural coral reef communities are found in the Operational Area. The nearest areas of significant coral reef to the Operational Area are the Glomar Shoals (approximately 40 km northeast), Dampier Archipelago (approximately 35 km southeast), Barrow/Montebello Islands (approximately 85 km southwest) and Ningaloo Reef (approximately 280 km southwest). Coral reef communities are widespread throughout the EMBA.

Corals are generally divided into two broad groups: the zooxanthellate (‘reef-building’, ‘hermatypic’ or ‘hard’) corals and the azooxanthellate (‘ahermatypic’ or ‘soft’) corals. The hard corals contain symbiotic microalgae (zooxanthellae) that enhance growth and allow the coral to secrete large amounts of calcium carbonate. The soft corals are generally smaller and often solitary (Tzioumis and Keable, 2007). Hard corals are generally found in shallower (<50 m) waters while the soft corals are found at most depths, particularly those below 50 m (Tzioumis and Keable, 2007).

Hard corals are widespread within the EMBA, with significant coral reefs occurring at a number of sites including within the Ningaloo Marine Park near Exmouth (Section 3.6.5), the Montebello/ Barrow/Lowendal islands, Muiron island, the Dampier Archipelago, Glomar Shoals, Rankin Bank, Mermaid Reef, the Rowley Shoals, Ashmore Reef and Scott Reef. The upwelling of cooler, nutrient-rich water from the Indian Ocean along the continental shelf break provides preferential conditions for the development of hard corals (DEWHA, 2008a). In the NWS region coral reefs in clearer, offshore waters typically have higher coral density and diversity than reefs associated with turbid near-shore waters (Woodside, 2006).

The Ningaloo Reef is unique in that it is a mainland fringing coral reef, the largest of its kind in Australia (CALM and MPRA, 2005). The Ningaloo Reef extends over 260 km and is the only large reef in the world found so close to the western coast of a continental land mass (within 100 m at closest point). The Reef includes intertidal and deeper sub-tidal corals, with over 300 species representing 54 genera recorded (UNESCO, 2011).

In addition to the larger coral reefs that have regional significance, smaller reefs and individual coral colonies are found throughout areas where water quality and benthic substrate are conducive to coral survival. Intertidal hard corals also occur within the EMBA, typically as individual colonies on rocky shores. These intertidal corals do not form a large habitat class within the region, with beaches/mudflats and mangroves the most common shoreline habitat.

Significant coral spawning occurs in autumn for a number of species, although some taxa such as Porites and Acropora spp. may spawn in spring and summer (Baird et al., 2011; Rosser and Gilmour, 2008). Spawning events have been observed throughout the Dampier Archipelago in March and April (Stoddart and Gilmour, 2005) and along the Ningaloo Coast during March (Simpson et al., 1993).

3.4.1.3 Seagrasses

Seagrasses are widespread throughout the shallower areas of the EMBA. No seagrasses are present within the Operational Area (Figure 3-4).

Seagrass are marine flowering plants, with about 30 species found in Australian waters (Huisman, 2000). Seagrass generally grows in soft sediments within intertidal and shallow subtidal waters where there is sufficient light and are common in sheltered coastal areas such as bays, lees of islands and fringing coastal reefs (McClatchie et al., 2006; McLeay et al., 2003). Seagrasses are important primary producers in tropical in-shore waters as they provide energy and nutrients for detrital grazing food webs. Seagrass meadows are important in stabilising seabed sediments, and providing nursery grounds for fish and crustaceans, and a protective habitat for the juvenile fish and invertebrates species (Huisman, 2000; Kirkman, 1997). Seagrasses also provide important habitat for fish and dugongs within the Northwest Shelf Province (DEWHA, 2008).

Seagrass species within the EMBA exhibit seasonal trends in abundance and distribution (Orth et al., 2006). Natural disturbance events such as cyclones and dugong grazing can also affect local seagrass distribution and abundance.

Ideal conditions for seagrasses include clear waters, low nutrients, protection from heavy seas and swells, and sandy substrate. Many seagrass species are perennial (grow all year round) and cover extensive areas, such as those of Shark Bay and Exmouth Gulf. Seagrasses can also be found adjacent to offshore islands, including Dampier Archipelago and the Montebello and Barrow islands (CALM and MPRA, 2005; DEC, 2006).

Seagrass meadows are mostly found in the sheltered bays along the southern mainland coast of the Kimberley region, as well as along the coast between Shark Bay and Augusta. Coastal shallow-water seagrass habitats account for only 0.2% of Australia's coastlines (Duke et. al., 2010). Montebello and Barrow Islands contain sparse seagrass habitat (McMahon et al., 2017), however the closest known key areas of seagrass habitat to the Wandoo Facility is the Exmouth Gulf and Ningaloo Reef area.

3.4.1.4 Macroalgae

Macroalgae are not found within the Operational Area, however are widespread within shallower areas within the EMBA (Figure 3-4). Macroalgae are generally found where hard substrates occur; although macroalgae such *Caulerpa*, *Halimeda, Udotea* and *Penicillus* can anchor in soft sediments or attach to shell fragments or rubble. Subtidal macroalgae often occur with coral reefs, colonising dead coral and coral rubble for attachment. Intertidal macroalgae may also occur throughout the EMBA, as there is widespread intertidal hard substrate and intertidal rock platforms suitable for macroalgal growth. Macroalgae are important primary producers and support diverse and abundant fauna of small invertebrates that are the principal food source for many in-shore fish species.

A large number of tropical macroalgal species have been recorded from the region, with over 200 species documented in the Pilbara alone (Huisman, 2004; Huisman and Borowitzka, 2003). Macroalgal habitat within the region may occur in subtidal or intertidal areas of hard substrate where sufficient light is available for photosynthesis. Such areas are likely to include shallow (<25 m) subtidal reefs and rocky intertidal shores and be widespread throughout the region.

Due to the widespread nature of macroalgal habitat within the EMBA, there are no identified areas of significant environmental value.

3.4.2 Key Coastal Communities

Table 3-1 identifies that key coastal communities are relevant receptors within the Hydrocarbon Area and EMBA that may be relevant to aspects of the drilling activities. The description below provides sufficient details to assess all impacts and risks to key coastal communities.

3.4.2.1 Mangroves

No mangrove communities are found within the Operational Area. The closest regionally significant mangroves to the Operational Area occur within the Dampier Archipelago. Other regionally significant areas of mangrove habitat occurring within the EMBA include the Montebello Islands, Ningaloo Coast, and scattered areas along the coast between Onslow and just north of Port Hedland (EPA, 2001).

Mangroves can occur on a wide range of geomorphic types (Semeniuk, 1986) and are one of the dominant intertidal and coastal habitat classes within the EMBA, with extensive belts of mangroves between Coral Bay and Eighty Mile Beach (Carr and Livesey, 1996) (Figure 3-5). They also occur on the offshore islands in the region, including Barrow Island, the Montebello Islands and the Dampier Archipelago.

Mangrove communities in the Pilbara region are classified as ‘tropical arid’ mangroves and represent Australia’s only ‘tropical-arid’ mangroves (Pedretti and Paling, 2000). WA does not support any unusual, endemic or restricted mangrove species. All mangrove species within WA are common and widespread elsewhere, either in northern Australia or in the Indo-Pacific region near northern Australia.

All of the 18 species of mangroves found in WA are found in the North West, with the highest mangrove diversity occurring in the Kimberley and Pilbara region (Pedretti and Paling, 2000), with diversity tending to decrease at higher latitudes.

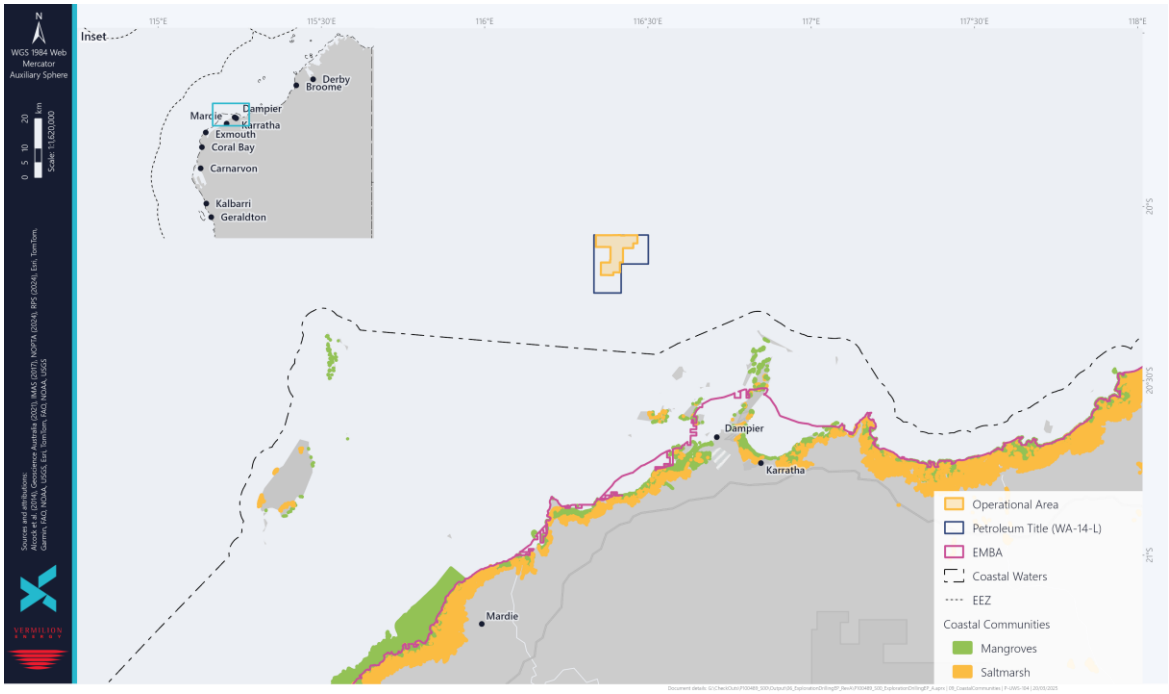
Mangroves are recognised as significant because they are productive coastal forest systems, providing habitat and shelter for infauna, epifauna, gastropods, crustaceans, fish and other marine species. Mangroves are important nursery areas for fish, lobster and prawn species, some of which are targeted by recreational and commercial fishers (Nagelkerken et al., 2008; DEC, 2007a). Mangroves may also provide shelter for other species such as juvenile turtles (DEC, 2007a). Ospreys (*Pandion haliaetus*) and white-bellied sea eagles (*Haliaeetus leucogaster*) roost in mangroves, while brahminy kites (*Haliastur indus*) and a range of smaller birds nest in them (DEC, 2007a). Mangroves are also recognised for their capacity to protect coastal areas from erosion due to storms and storm surge.

3.4.2.2 Saltmarsh

No saltmarsh communities are found within the Operational Area. Saltmarsh habitat is common within tidal flats or wetland habitats along the Pilbara coast within the EMBA (Figure 3-5).

Saltmarshes are terrestrial halophytic (salt-adapted) ecosystems that mostly occur in the upper-intertidal zone. They are typically dominated by dense stands of halophytic plants such as herbs, grasses and low shrubs. The diversity of saltmarsh plant species increases with increasing latitude (in contrast to mangroves). The vegetation in these environments is essential to the stability of the saltmarsh, as they trap and bind sediments. The sediments supporting saltmarsh are generally sandy silts and clays, and can often have high organic material content. Saltmarshes provide a habitat for a wide range of both marine and terrestrial fauna, including infauna and epifaunal invertebrates, fish, and birds (DEE, 2016).

Figure 3-5: Key coastal communities



3.4.2.3 Intertidal Beaches/Mudflats

No Intertidal beaches or mudflats are found within the Operational Area, however are widespread throughout the EMBA, occurring on both mainland and island shores (Figure 3-6). Intertidal beaches and mudflats in the region host a range of infauna, including molluscs and polychaetes that are likely to be an important food source for wading birds (DoE, 2015c).

Three intertidal beach/mudflat areas of international conservation significance occur within the EMBA: Bandicoot Bay, Eighty Mile Beach, and Roebuck Bay. These habitats are recognised as an important resource for a diverse range of migratory bird species, the majority of which feed in the area after migrating from the northern hemisphere (DoE, 2015c). Bandicoot Bay is a Conservation Reserve within the Montebello/Barrow Islands Marine Management Area. Eighty Mile Beach and Roebuck Bay are listed under the Ramsar Convention (Section 3.6.6) and are assigned specific protection under the EPBC Act.

3.4.2.4 Rocky Shorelines/Intertidal Reef Platforms

Rocky shorelines and intertidal reef platforms are widespread throughout the EMBA, occurring on both mainland and island shores (Figure 3-6). No rocky shorelines/intertidal reef platforms are found within the Operational Area.

Rocky shores can include pebble/cobble, boulders, rocky limestone cliffs and horizontal rock platforms. Examples include areas with or without a sediment veneer of varying thickness. Rocky shoreline formations offer habitat to a range of intertidal species including invertebrates and shorebirds. Rocky shorelines are found across the region and are often indicative of high-energy areas (wave action) where sediment deposition is limited or restricted. They are formed from limestone pavement extending out from the beach into subtidal zones, e.g. along the Ningaloo Coast and North West Cape. Higher relief platforms (>0.5 m off the high-water mark) are also present at several headlands along the North West Cape (DEC, 2006).

Intertidal reef platforms are located in the intertidal zone and consist of hard bedrock. Intertidal platforms support a diverse assemblage of vertebrates and invertebrates, particularly in vegetated areas. Coral reef communities located in the intertidal zone include the reef crest, shallow reef fronts, reef flat and shallow back reef zones, generally with a mixture of live coral and macro-algal coverage. Subtidal communities include the upper seaward reef slope, sheltered back reef, deep lagoonal reef and bommie clusters with a high percentage of hard corals, macro-algae and coralline algae (Bancroft, 2003). Invertebrates such as polychaete worms, crustaceans and echinoderms are also known to be present.

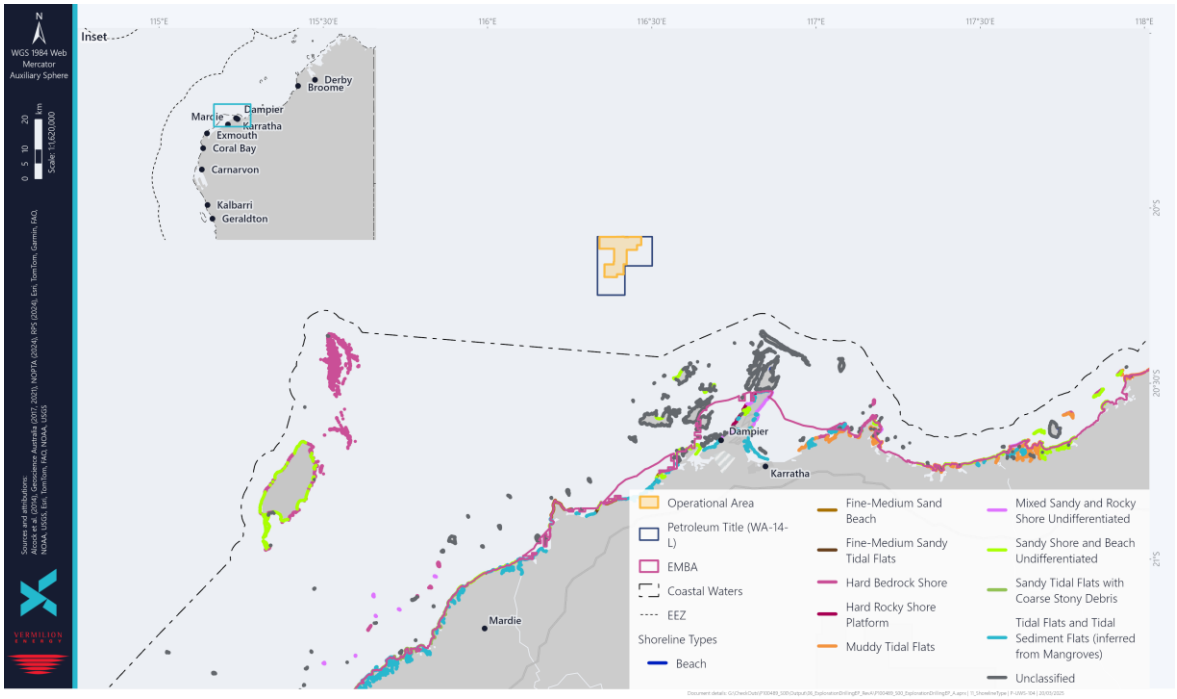
3.4.2.5 Sandy Beaches

Sandy beaches are found throughout the EMBA, but not in the Operational Area (Figure 3-6).

Sandy beaches are those areas within the intertidal zone where unconsolidated sediment has been deposited by wave and tidal action. Sandy beaches can vary from low to high energy zones which will influence the profile of each beach through varying rates of erosion and accretion. They are generally interspersed among areas of hard substrate (e.g. sandstone) that form intertidal platforms and rocky outcrops. Sandy beaches are found throughout the coastal areas of the EMBA.

Sandy beaches provide habitat for a variety of burrowing invertebrates and subsequently provide foraging areas for seabirds. Crested terns are known to nest on sandy beaches. Further detail on breeding and nesting sites for seabirds and shorebirds are provided in Section 3.4.3.3.

Figure 3-6: Shoreline types



Sandy beaches can also provide a turtle nesting habitat, particularly at the Barrow/Montebello/ Lowendal islands and Ningaloo Coast. Further information on turtle nesting areas is provided in Section 3.4.3.6 and 3.4.4.

3.4.3 Key Marine Fauna

Table 3-1 identifies that key marine fauna are receptors within the Operational Area, Hydrocarbon Area and EMBA may be relevant to aspects of the exploration drilling activities. The descriptions below provide sufficient details to assess all impacts and risks to key marine fauna. Where figures have been included for key marine fauna, they show BIAs within around 100 km of the Operational Area.

3.4.3.1 Plankton

Plankton species, including both phytoplankton and zooplankton, are a key component in oceanic food chains. Phytoplankton are autotrophic planktonic organisms living within the photic zone; and reside at the start of the food chain in the ocean (McClatchie et al., 2006). Phytoplankton communities are largely comprised of protists, including green algae, diatoms, and dinoflagellates (McClatchie et al., 2006). There are three size classes of phytoplankton: microplankton (>20 µm), nanoplankton (2-20 µm) and picoplankton (<2 µm) (Broatas et al., 2022). Diatoms and dinoflagellates are the most abundant of the micro and nanoplankton size classes and are generally responsible for the majority of oceanic primary production (McClatchie et al., 2006). Phytoplankton are dependent on oceanographic processes (e.g. currents and vertical mixing), that supply nutrients needed for photosynthesis. Thus, phytoplankton biomass is typically variable (spatially and temporally), but greatest in areas of upwelling, or in shallow waters where nutrient levels are high.

Zooplankton is the faunal component of plankton, comprised of small protozoa, crustaceans (e.g. krill) and the eggs and larvae of other taxa such as fish, corals, and molluscs. Zooplankton includes species that drift with the currents and those that are motile. Zooplankton within the EMBA may include organisms that complete their lifecycle as plankton (e.g. copepods, euphausiids) as well as larval stages of other taxa such as fishes, corals, and molluscs. Peaks in zooplankton can occur from mass coral spawning events (typically occurring in March – April and September – November) (Rosser and Gilmour, 2008). Fish larvae abundance occurs throughout the year (Harris et al., 2005; Rosser and Gilmour, 2008; Simpson et al., 1993). Some of these taxa are commercially and recreationally important species in the region.

Primary productivity of the NWMR is generally low and appears to be largely driven by offshore influences (Brewer et al., 2007), with periodic upwelling events and cyclonic influences driving coastal productivity through nutrient recycling and advection. Within the region, peak primary productivity along the shelf edge occurs in late summer/early autumn. Variation in productivity can also be linked to higher biologically productive period in the area (e.g. mass coral spawning events).

Plankton communities within the EMBA are expected to reflect conditions of the NWMR.

3.4.3.2 Benthic Invertebrates

The benthic invertebrates of the NWS region are of low abundance but highly diverse and comprised largely of borrowing polychaete worms and crustaceans (Rainer, 1991). Echinoderms and molluscs are also common on the continental shelf and slope in this region. The diversity and abundance of benthic invertebrates decreases with distance from the coast over most of the NWS—this may be attributed to increasing depth or increasing distance from terrestrial and coastal organic input (SKM, 1996).

A baseline survey, conducted in May 1996 (BBG, 1996) prior to installation of the Wandoo facilities, concluded that the infaunal assemblage was depauperate, with low numbers of species and low abundance. Most of the common species (small crabs, shrimps and polychaetes) are detritivores, feeding on organic matter in the surface layers of the sediment. This survey also found that most areas were bare of epifauna but occasional epifauna mainly sponges and corals were observed.

Subsequent environmental surveys conducted in 1998 (SKM, 1998), 2015 (Aurecon, 2016), and 2024 (Worley, 2025) showed benthic infauna composition that was considerably different, with amphipods being the most abundant infauna group. In the 1996 survey the most abundant taxon was crustaceans, the 1998 survey showed polychaete was the most abundant taxon, and nematodes the most dominant group in 2015 survey. The overall abundance and richness of infauna was higher in the 2024 survey in comparison to previous surveys (Worley, 2025). On a regional scale, the infaunal community in the vicinity of the Operational Area is also comparable to those at similar sites on the NWS.

It is unlikely that the infaunal community would have changed significantly from the baseline survey as the infaunal assemblage was depauperate, with low numbers of species and low abundance.

3.4.3.3 Seabirds and Shorebirds

The presence of EPBC-listed bird species in the Project Areas is shown in Table 3-2. The presence of most species, particularly within the Operational Area are expected to be of a transitory nature only. Table 3-7 identified BIAs for 14 species that overlap the EMBA and one (the wedge-tailed shearwater) breeding BIA intersects the Operational Area. The wedge-tailed shearwater and several species within the vicinity of the Operational Area are discussed below. Other species with BIAs overlapping the EMBA are discussed further in Section 3.4.4.

Table 3-2: EPBC-Listed seabird and shorebird species or species habitat that may occur within the Project Areas

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Actitis hypoleucos	Common Sandpiper		x(W)	x	MO	KO	KO
Anous stolidus	Common Noddy		x(M)	x	LO	LO	LO
Anous tenuirostris melanops	Australian Lesser Noddy	V		x		FLO	FKO
Aphelocephala leucopsis	Southern Whiteface	V					LO
Ardenna carneipes	Flesh-footed Shearwater		x(M)	x		FLO	FLO
Ardenna pacifica	Wedge-tailed Shearwater		x(M)	x		BLO	BKO
Arenaria interpres	Ruddy Turnstone	V	x(W)				RKO
Apus pacificus	Fork-tailed Swift		x(M)	x	LO	LO	LO
Bubulcus ibis	Cattle Egret			x		MO	MO
Calidris acuminata	Sharp-tailed Sandpiper	V	x(W)	x	MO	KO	RKO
Calidris alba	Sanderling		x(W)	x			RKO
Calidris canutus	Red Knot	V	x(W)	x	MO	KO	KO
Calidris ferruginea	Curlew Sandpiper	CE	x(W)	x	MO	KO	KO
Calidris melanotos	Pectoral Sandpiper		x(W)	x	MO	MO	KO
Calidris pugnax	Ruff		x(W)	x			RKO
Calidris ruficollis	Red-necked Stint		x(W)	x			RKO
Calidris subminuta	Long-toed Stint		x(W)	x			KO
Calidris tenuirostris	Great Knot	V	x(W)	x			RKO
Calonectris leucomelas	Streaked Shearwater		x(M)	x	LO	LO	KO
Chalcites osculans	Black-eared Cuckoo			x		KO	KO
Charadrius leschenaultii	Greater Sand Plover	V	x(W)	x		KO	KO
Charadrius mongolus	Lesser Sand Plover	E	x(W)	x			RKO
Charadrius ruficapillus	Red-capped Plover			x			RKO
Charadrius veredus	Oriental Plover		x(W)	x		MO	RKO

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Chroicocephalus novaehollandiae	Silver Gull			x		BKO	BKO
Cuculus optatus	Oriental Cuckoo		x(T)				MO
Diomedea amsterdamensis	Amsterdam Albatross	E	x(M)	x		LO	LO
Diomedea epomophora	Southern Royal Albatross	V	x(M)	x		MO	MO
Diomedea exulans	Wandering Albatross	V	x(M)	x		MO	LO
Erythrotriorchis radiatus	Red Goshawk	E				MO	MO
Falco hypoleucos	Grey Falcon	V				KO	KO
Fregata ariel	Lesser Frigatebird		x(M)	x	LO	KO	BKO
Fregata minor	Great Frigatebird		x(M)	x	MO	MO	MO
Gallinago megala	Swinhoe's Snipe		x(W)	x			RLO
Gallinago stenura	Pin-tailed Snipe		x(W)	x			RLO
Glareola maldivarum	Oriental Pratincole		x(W)	x		MO	RKO
Haliaeetus leucogaster	White-bellied Sea-Eagle			x		KO	KO
Himantopus himantopus	Pied Stilt			x			RKO
Hirundo rustica	Barn Swallow		x(T)	x		MO	KO
Hydroprogne caspia	Caspian Tern		x(M)	x		BKO	BKO
Larus pacificus	Pacific Gull			x		BKO	BKO
Limicola falcinellus	Broad-billed Sandpiper		x(W)	x			RKO
Limnodromus semipalmatus	Asian Dowitcher	V	x(W)	x		KO	KO
Limosa lapponica menzbieri	Northern Siberian Bar-tailed Godwit	E				KO	KO
Limosa lapponica	Bar-tailed Godwit		x(W)	x		KO	KO
Limosa limosa	Black-tailed Godwit	E	x(W)	x			RKO
Macronectes giganteus	Southern Giant-Petrel	E	x(M)	x	MO	MO	MO
Macronectes halli	Northern Giant Petrel	V	x(M)	x		MO	LO
Malurus leucopterus edouardi	White-winged Fairy-wren (Barrow Island)	V				LO	LO
Malurus leucopterus leucopterus	White-winged Fairy-wren (Dirk Hartog Island)	V					LO
Merops ornatus	Rainbow Bee-eater			x		MO	MO
Motacilla cinerea	Grey Wagtail		x(T)	x		MO	MO
Motacilla flava	Yellow Wagtail		x(T)	x		MO	KO

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Numenius madagascariensis	Eastern Curlew	CE	x(W)	x	MO	KO	KO
Numenius minutus	Little Curlew		x(W)	x			RKO
Numenius phaeopus	Whimbrel		x(W)	x			RKO
Onychoprion anaethetus	Bridled Tern		x(M)	x		BKO	BKO
Onychoprion fuscatus	Sooty Tern			x		BKO	BKO
Pandion haliaetus	Osprey		x(W)	x		BKO	BKO
Papasula abbotti	Abbott's Booby	E		x		MO	MO
Pezoporus occidentalis	Night Parrot	E				MO	MO
Phaethon lepturus	White-tailed Tropicbird		x(M)	x	MO	KO	BKO
Phaethon lepturus fulvus	Christmas Island White-tailed Tropicbird	E		x	MO	MO	MO
Phalaropus lobatus	Red-necked Phalarope		x(W)	x			KO
Phaethon rubricauda	Red-tailed Tropicbird		x(M)	x			BKO
Phaethon rubricauda westralis	Red-tailed Tropicbird (Indian Ocean)	E			LO	KO	BKO
Phoebetria fusca	Sooty Albatross	V	x(M)	x			MO
Pluvialis fulva	Pacific Golden Plover		x(W)	x			RKO
Pluvialis squatarola	Grey Plover	V	x(W)	x			RKO
Polytelis alexandrae	Princess Parrot	V					MO
Pterodroma macroptera	Great-winged Petrel			x		FKO	FKO
Pterodroma mollis	Soft-plumaged Petrel	V				FLO	FLO
Puffinus assimilis	Little Shearwater			x		FKO	FKO
Recurvirostra novaehollandiae	Red-necked Avocet			x			RKO
Rostratula australis	Australian Painted Snipe	E				LO	LO
Stercorarius antarcticus	Brown Skua			x		MO	MO
Sterna dougallii	Roseate Tern		x(M)	x	BLO	BKO	BKO
Sternula albifrons	Little Tern	V	x(M)	x		BKO	BKO
Sternula nereis	Fairy Tern			x		BKO	BKO
Sternula nereis nereis	Australian Fairy Tern	V			BKO	BKO	BKO
Stiltia isabella	Australian Pratincole			x			RKO
Sula dactylatra	Masked Booby		x(M)	x			BKO
Sula leucogaster	Brown Booby		x(M)	x		BKO	BKO
Thalassarche carteri	Indian Yellow-nosed Albatross	V	x(M)	x		MO	LO

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Thalassarche cauta	Shy Albatross	E	x(M)	x		MO	MO
Thalassarche impavida	Campbell Albatross	V	x(M)	x		MO	MO
Thalassarche melanophris	Black-browed Albatross	V	x(M)	x		MO	LO
Thalassarche steadi	White-capped Albatross	V	x(M)	x		MO	MO
Thalasseus bengalensis	Lesser Crested Tern			x		BKO	BKO
Thalasseus bergii	Greater Crested Tern		x(W)	x		BKO	BKO
Tringa brevipes	Grey-tailed Tattler		x(W)	x			RKO
Tringa glareola	Wood Sandpiper		x(W)	x			KO
Tringa nebularia	Common Greenshank	E	x(W)	x		LO	KO
Tringa stagnatilis	Marsh Sandpiper		x(W)	x			RKO
Tringa totanus	Common Redshank		x(W)	x			RKO
Xenus cinereus	Terek Sandpiper	V	x(W)	x			RKO

Threatened Species:
V Vulnerable
E Endangered
CE Critically Endangered

Migratory Species:
M Marine
W Wetland
T Terrestrial

Type of Presence:
MO Species of species habitat may occur within area
LO Species or species habitat likely to occur within area
KO Species or species habitat known to occur within area
FMO Foraging, feeding or related behaviour may occur within area
FLO Foraging, feeding or related behaviour likely to occur within area
FKO Foraging, feeding or related behaviour known to occur within area
BLO Breeding likely to occur within area
BKO Breeding known to occur within area
RLO Roosting likely to occur within area
RKO Roosting known to occur within area
CKO Congregation or aggregation known to occur within area

Wedge-tailed Shearwater

A breeding BIA for the wedge-tailed shearwater (*Ardenna pacifica*) (Figure 3-7) intersects with the Operational Area. This BIA is based on buffer areas surrounding the offshore islands (e.g. within Dampier Archipelago) that are used for nesting by this species.

The wedge-tailed shearwater is a pelagic species, listed as migratory under the EPBC Act and has widespread distribution across the Indian and Pacific oceans with a global population of 2.6 million pairs. Of this population, approximately 1 million pairs breed in Australia, predominantly on islands off the coast of WA between Ashmore Reef and Rottnest Island. The largest breeding populations are found on the Houtman Abrolhos (~600,000 pairs) (Surman and Nicholson, 2009) and throughout the NWS region of the NWMR, where large populations exist

on Muiron Islands (300,000 pairs) and Serrurier Island (60,000 pairs) (Surman and Nicholson, 2009; 2015).

Adults are absent from their breeding colonies during the interbreeding period and return from their tropical Indian Ocean over-wintering grounds from late June onwards to re-excavate their burrows. This species is highly synchronous in timing of breeding; all eggs within a colony are laid within a ten-day period. Once hatched, adults leave the burrows to forage locally during the day returning at night to feed chicks until they are ready to fledge (Nicholson, 2002). Due to the high synchronicity in egg laying, fledging is restricted to the first two weeks of April (Nicholson, 2002).

Following breeding, wedge-tailed shearwaters on the Houtman Abrolhos Islands and Varanus Island migrate 4,500 km north-west to equatorial waters of the Indian Ocean around 90°E (Surman et al., 2018), traversing the NWMR.

Roseate Tern

A Breeding BIA for the roseate tern (*Sterna dougallii*) (Figure 3-7) intersects the Hydrocarbon Area and EMBA. The roseate tern is listed migratory under the EPBC Act. This species is generally sub-tropical in distribution and there are many breeding populations in the NWMR, including Dampier Archipelago and the Lowendal Islands.

The largest roseate tern breeding colony in Western Australia is in the Houtman Abrolhos Islands (Surman and Nicholson, 2009). Large colonies breed within the Lowendal Island and Montebello Island region where there is a stronghold for this species (Higgins and Davies 1996). A large breeding colony has also been recorded on Goodwyn Island on the Dampier Archipelago (Higgins and Davies 1996). Peak breeding times across the NWMR area is between May to August.

Birds are known to usually move away from breeding colonies following breeding, but their non-breeding range is not well defined (Higgins and Davies, 1996). Roseate terns will forage diurnally, up to 60 km from their colonies and always over deeper shelf waters, rather than shallow coastal areas (Surman and Wooller, 2003). Roseate terns will also readily raft (roost in flocks on the sea surface) after foraging episodes (Commonwealth of Australia, 2020).

Roseate terns predominately eat small pelagic fish taken by plunge diving or surface dipping, typically foraging in dense flocks overflying predatory fishes that push their prey to the surface. Roseate terns may plunge to 20 cm depth.

Fairy Tern

A Breeding BIA for the fairy tern (*Sterna nereis*) (Figure 3-7) intersects the Hydrocarbon Area and EMBA. The Australian fairy tern is Marine listed under the EPBC Act and the subspecies Australian fairy tern (*Sterna nereis nereis*) is listed as vulnerable. The WA breeding population (approximately 5,000-6,000 mature individuals) is dispersed over approximately 2,500 km of coastline (Greenwell, 2021). Within Western Australia, the subspecies comprises a sedentary Pilbara population and a partially-migratory population extending from Exmouth to Point Malcolm. Individuals of the partially-migratory population may occasionally birds migrate into the southern region of the NWMR during the winter months.

The partially-migratory population is widely distributed and winters primarily around the northern Houtman Abrolhos Islands (Greenwell, 2021). These birds migrate to breeding areas as far south as Point Malcolm on the eastern south coast and as far north as the Ningaloo coast, while others remain within the Houtman Abrolhos Archipelago (Greenwell, 2021).

Within the NWMR breeding occurs in small colonies between June-September on offshore islands, including Simpson Island, Barrow Island, the Montebello Islands, the Lowendal Islands, Thevenard Island, Serrurier Island, the islands in the Dampier Archipelago, Maryanne Shoals and Egret Island (Dunlop, 2018; Johnstone et al., 2013). Colonies tend to occupy areas rather than fixed sites, and nest sites can be abandoned after one or more years, even if they have been successful (Saunders and de Rebeira, 1985).

While information regarding foraging ecology of this species within the NWMR is lacking, the Australian fairy tern has been studied in South Australia. Here, species typically forages in inshore waters and has been reported to rarely travel beyond 2 km during the breeding season in South Australia (Paton and Rogers, 2009).

Australian fairy terns are diurnal plunge diving, feeding exclusively on small (<60 mm) surface schooling bait fishes throughout their range. Prey include species of sprats, hardy heads and larval prey of some demersal fish species. Unlike many other terns, fairy terns are not dependent upon large pelagic fishes to drive their prey to the surface (Paton and Rogers, 2009).

Lesser Crested Tern

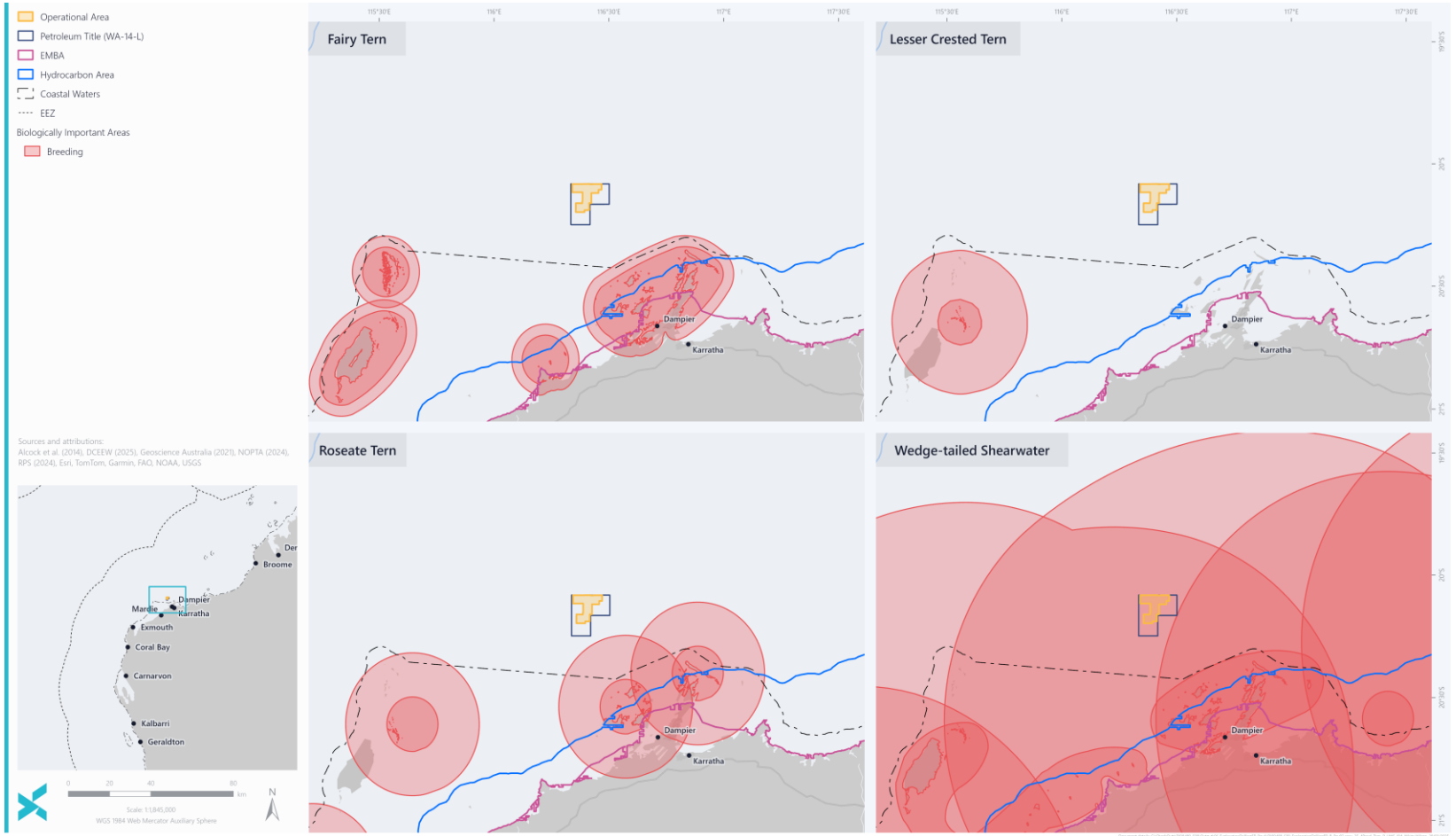
A Breeding BIA for the lesser crested tern (*Thalasseus bengalensis*) (Figure 3-7) intersects the Hydrocarbon Area and EMBA. There is no conservation listing for this species.

Many populations remain sedentary in their breeding areas or disperse locally (del Hoyo et al., 1996), although some are more migratory (Urban et al., 1986). The species breeds in large, dense colonies, or in small groups of fewer than ten pairs amidst colonies of other species, such as silver gull (del Hoyo et al., 1996). Colonies are located on islands, including those as far offshore as Bedout, Legendre and the Montebello and Lowendal islands (Johnstone et al., 2013). Adult breeders have shown both high site fidelity and also flexibility in their breeding localities depending upon the spatial and temporal reliability of food resources (Crawford et al., 2002).

Breeding occurs from late March to May (Johnstone et al., 2013). During breeding, crested terns conduct short, diurnal foraging trips close (<40 km) to the colony (Surman and Wooller, 2003; Rock et al., 2007; Mcleay et al., 2010) with most foraging behaviour displayed by individuals at distances >5 km (Mcleay et al., 2010).

The chicks are predominantly fed pelagic fish, a diet that varies among colonies and years (Chiaradia et al., 2002). Adults may forage more widely on inshore reef fish (Surman and Wooller, 2003), crustaceans and cephalopods using a plunge diving method (Commonwealth of Australia, 2020).

Figure 3-7: Biologically important areas for the fairy tern, lesser crested tern, roseate tern and wedge-tailed shearwater



3.4.3.4 Fish, Sharks and Rays

EPBC-Listed fish, shark and ray species presence within the Project Areas is shown in Table 3-3. A BIA for the whale shark overlaps the Operational Area (Table 3-7) as discussed below. Other species with BIAs overlapping the EMBA are discussed further in Section 3.4.4.

Table 3-3: EPBC-Listed fish, shark and ray species or species habitat that may occur within the Project Areas

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Sharks and rays							
Anoxypristis cuspidata	Narrow Sawfish		x(M)		LO	KO	KO
Carcharhinus longimanus	Oceanic Whitetip Shark		x(M)		LO	LO	LO
Carcharias taurus	Grey Nurse Shark		x(M)			CKO	CKO
Carcharias taurus (west coast population)	Grey Nurse Shark (west coast population)	V			LO	CKO	CKO
Carcharodon carcharias	White Shark	V	x(M)		MO	KO	KO
Centrophorus uyato	Little Gulper Shark	CD				LO	LO
Glyphis garricki	Northern River Shark	E					MO
Isurus oxyrinchus	Shortfin Mako		x(M)		LO	LO	LO
Isurus paucus	Longfin Mako		x(M)		LO	LO	LO
Lamna nasus	Porbeagle		x(M)			MO	MO
Mobula alfredi	Reef Manta Ray		x(M)		KO	KO	KO
Mobula birostris	Giant Manta Ray		x(M)		LO	KO	KO
Pristis clavata	Dwarf Sawfish	V	x(M)		KO	KO	BKO
Pristis pristis	Freshwater Sawfish	V	x(M)		MO	LO	KO
Pristis zijsron	Green Sawfish	V	x(M)		KO	KO	BKO
Rhincodon typus	Whale Shark	V	x(M)		FKO	FKO	FKO
Sphyrna lewini	Scalloped Hammerhead	CD			LO	KO	KO
Other							
Acentronura australe	Southern Pygmy Pipehorse			x			MO
Acentronura larsonae	Helen's Pygmy Pipehorse			x		MO	MO
Bhanotia fasciolata	Corrugated Pipefish			x			MO
Bulbonaricus brauni	Braun's Pughead Pipefish			x		MO	MO
Campichthys galei	Gale's Pipefish			x		MO	MO
Campichthys tricarinatus	Three-keel Pipefish			x	MO	MO	MO
Choeroichthys brachysoma	Pacific Short-bodied Pipefish			x	MO	MO	MO

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Choeroichthys latispinosus	Muiron Island Pipefish			x	MO	MO	MO
Choeroichthys suillus	Pig-snouted Pipefish			x	MO	MO	MO
Corythoichthys amplexus	Fijian Banded Pipefish			x			MO
Corythoichthys flavofasciatus	Reticulate Pipefish			x	MO	MO	MO
Corythoichthys intestinalis	Australian Messmate Pipefish			x			MO
Corythoichthys schultzi	Schultz's Pipefish			x			MO
Cosmocampus banneri	Roughridge Pipefish			x	MO	MO	MO
Doryrhamphus dactyliophorus	Banded Pipefish			x	MO	MO	MO
Doryrhamphus excisus	Bluestripe Pipefish			x	MO	MO	MO
Doryrhamphus janssi	Cleaner Pipefish			x	MO	MO	MO
Doryrhamphus multiannulatus	Many-banded Pipefish			x	MO	MO	MO
Doryrhamphus negrosensis	Flagtail Pipefish			x	MO	MO	MO
Festucalex scalaris	Ladder Pipefish			x	MO	MO	MO
Filicampus tigris	Tiger Pipefish			x	MO	MO	MO
Halicampus brocki	Brock's Pipefish			x	MO	MO	MO
Halicampus grayi	Mud Pipefish			x	MO	MO	MO
Halicampus nitidus	Glittering Pipefish			x	MO	MO	MO
Halicampus spinirostris	Spiny-snout Pipefish			x	MO	MO	MO
Haliichthys taeniophorus	Ribboned Pipehorse			x	MO	MO	MO
Hippichthys penicillus	Beady Pipefish			x	MO	MO	MO
Hippocampus angustus	Western Spiny Seahorse			x	MO	MO	MO
Hippocampus breviceps	Short-head Seahorse			x			MO
Hippocampus histrix	Spiny Seahorse			x	MO	MO	MO
Hippocampus kuda	Spotted Seahorse			x	MO	MO	MO
Hippocampus planifrons	Flat-face Seahorse			x	MO	MO	MO
Hippocampus spinosissimus	Hedgehog Seahorse			x	MO	MO	MO
Hippocampus subelongatus	West Australian Seahorse			x			MO
Hippocampus trimaculatus	Three-spot Seahorse			x	MO	MO	MO

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Lissocampus fatiloquus	Prophet's Pipefish			x		MO	MO
Maroubra perserrata	Sawtooth Pipefish			x			MO
Micrognathus micronotopterus	Tidepool Pipefish			x	MO	MO	MO
Milyeringa justitia	Barrow Cave Gudgeon	E				KO	KO
Milyeringa veritas	Cape Range Cave Gudgeon	V				KO	KO
Mitotichthys meraculus	Western Crested Pipefish			x			MO
Nannocampus subosseus	Bonyhead Pipefish			x		MO	MO
Ophisternon candidum	Blind Cave Eel	V				KO	KO
Phoxocampus belcheri	Black Rock Pipefish			x	MO	MO	MO
Phycodurus eques	Leafy Seadragon			x			MO
Phyllopteryx taeniolatus	Common Seadragon			x			MO
Pugnaso curtirostris	Pugnose Pipefish			x			MO
Solegnathus hardwickii	Pallid Pipehorse			x	MO	MO	MO
Solegnathus lettiensis	Gunther's Pipehorse			x	MO	MO	MO
Solenostomus cyanopterus	Robust Ghostpipefish			x	MO	MO	MO
Stigmatopora argus	Spotted PipefisH			x			MO
Stigmatopora nigra	Widebody Pipefish			x			MO
Syngnathoides biaculeatus	Double-end Pipehorse			x	MO	MO	MO
Trachyrhamphus bicoarctatus	Bentstick Pipefish			x	MO	MO	MO
Trachyrhamphus longirostris	Straightstick Pipefish			x	MO	MO	MO
Urocampus carinirostris	Hairy Pipefish			x			MO
Vanacampus margaritifer	Mother-of-pearl Pipefish			x			MO

Threatened Species:

V Vulnerable
E Endangered
CE Critically Endangered

Migratory Species:

M Marine

Type of Presence:

MO Species of species habitat may occur within area
LO Species or species habitat likely to occur within area
KO Species or species habitat known to occur within area
FMO Foraging, feeding or related behaviour may occur within area
FLO Foraging, feeding or related behaviour likely to occur within area
FKO Foraging, feeding or related behaviour known to occur within area
BLO Breeding likely to occur within area
BKO Breeding known to occur within area

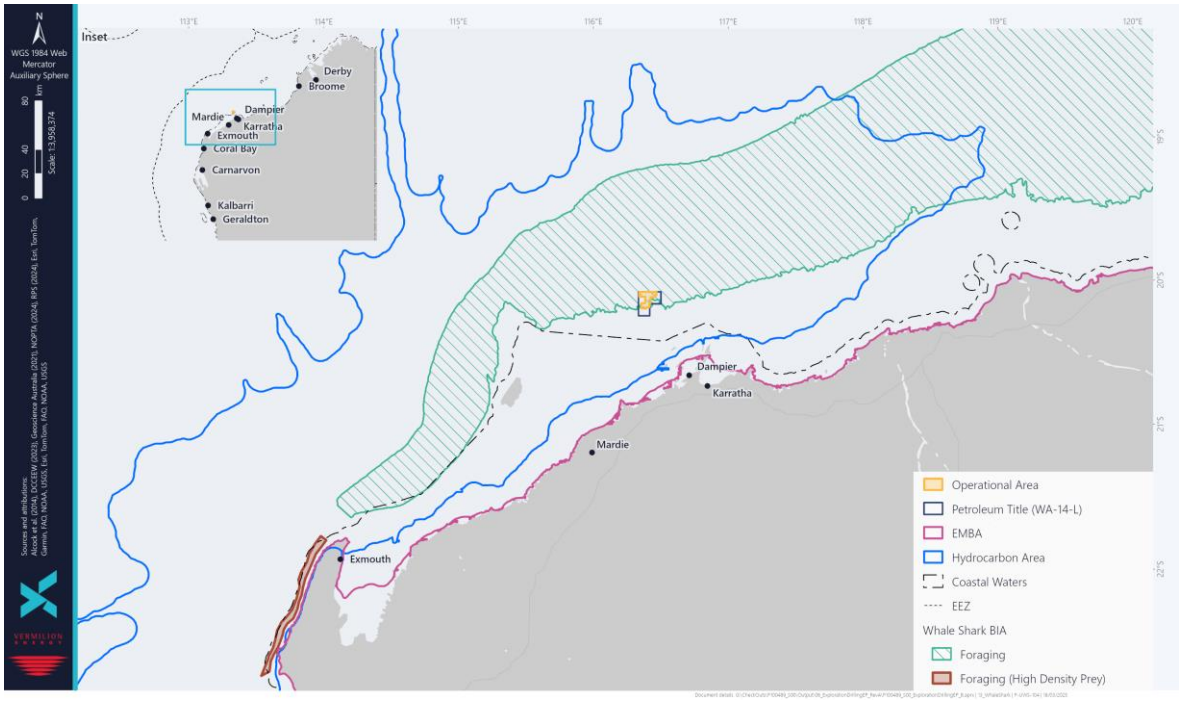
Scientific name		Common name		EPBC Act status			Project Areas		
				Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
W	Wetland	RLO	Roosting likely to occur within area						
T	Terrestrial	RKO	Roosting known to occur within area						
		CKO	Congregation or aggregation known to occur within area						

Whale Shark

A Foraging BIA for the whale shark (*Rhincodon typus*) intersects the Operational Area (Figure 3-8). However, it is known that the whale sharks are more common migrating along the 200 m depth contour, which is further offshore to the Wandoo facility (TSSC, 2015c). The whale shark is widely distributed in Australian waters; but Ningaloo Reef is the main known aggregation area in Western Australia. Whale sharks aggregate at Ningaloo which is approximately 274 km south-west of the Operational Area between March and July each year to feed. Aggregations occur due to seasonal concentrations of planktonic prey such as krill and zooplankton which are a source of food for the whale shark. The whale shark is a filter feeder and feeds at or close to the water's surface by swimming forward with mouth agape, sucking in prey. While the species is generally encountered close to or at the surface, it will regularly dive and move through the water column (DoE, 2024).

An observational study by D'Antonio et al. (2025) investigated the influences of geomorphological features and oil and gas platforms on whale shark movement patterns and habitat connectivity. Natural geomorphological features such as pinnacles, canyons, and seamounts were identified to promote habitat connectivity and strongly influence habitat use by whale sharks across regional and local spatial scales. Offshore oil and gas platforms were also observed to have a similar effect on habitat use as natural feature type and enhances habitat connectivity. The offshore oil and gas platforms most visited by whale sharks were located close to the edge of the continental shelf and near natural geomorphological features. Through the study by D'Antonio et al. (2025) it is possible that these offshore oil and gas platforms act like 'stepping-stone' during migration and may increase the impacts from collision risks.

Figure 3-8: BIAs for the whale shark



3.4.3.5 Marine Mammals

EPBC-Listed marine mammal species presence within the Project Areas is shown in Table 3-4.

Table 3-7 identified BIAs for 3 species overlapping the EMBA, which are discussed further below.

Table 3-4: EPBC-Listed marine mammal species or species habitat that may occur within the Project Areas

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Cetaceans							
Balaenoptera acutorostrata	Minke Whale			x	MO	MO	LO
Balaenoptera bonaerensis	Antarctic Minke Whale		x(M)	x		LO	LO
Balaenoptera borealis	Sei Whale	V	x(M)	x	MO	FLO	FLO
Balaenoptera edeni	Bryde's Whale		x(M)	x	MO	LO	LO
Balaenoptera musculus	Blue Whale	E	x(M)	x	LO	MKO	MKO
Balaenoptera physalus	Fin Whale	V	x(M)	x	MO	FLO	FLO
Delphinus delphis	Common Dolphin			x	MO	MO	MO
Eubalaena australis	Southern Right Whale	E	x(M)	x		LO	LO
Feresa attenuata	Pygmy Killer Whale			x		MO	MO

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Globicephala macrorhynchus	Short-finned Pilot Whale			x		MO	MO
Globicephala melas	Long-finned Pilot Whale			x		MO	MO
Grampus griseus	Risso's Dolphin			x	MO	MO	MO
Indopacetus pacificus	Longman's Beaked Whale			x		MO	MO
Kogia breviceps	Pygmy Sperm Whale			x		MO	MO
Kogia sima	Dwarf Sperm Whale			x		MO	MO
Lagenodelphis hosei	Fraser's Dolphin, Sarawak Dolphin			x		MO	MO
Megaptera novaeangliae	Humpback Whale		x(M)	x	BKO	BKO	BKO
Mesoplodon bowdoini	Andrew's Beaked Whale			x		MO	MO
Mesoplodon densirostris	Blainville's Beaked Whale			x		MO	MO
Mesoplodon ginkgodens	Gingko-toothed Beaked Whale			x		MO	MO
Mesoplodon grayi	Gray's Beaked Whale			x		MO	MO
Mesoplodon layardii	Strap-toothed Beaked Whale			x		MO	MO
Mesoplodon mirus	True's Beaked Whale			x		MO	MO
Orcaella heinsohni	Australian Snubfin Dolphin	V	x(M)	x	MO	KO	KO
Orcinus orca	Killer Whale		x(M)	x	MO	MO	MO
Peponocephala electra	Melon-headed Whale			x		MO	MO
Physeter macrocephalus	Sperm Whale			x		MO	MO
Pseudorca crassidens	False Killer Whale			x	LO	MO	LO
Sousa sahulensis	Australian Humpback Dolphin	V	x(M)	x	MO	KO	KO
Stenella attenuata	Spotted Dolphin			x	MO	MO	KO
Stenella coeruleoalba	Striped Dolphin			x		MO	MO
Stenella longirostris	Long-snouted Spinner Dolphin			x		MO	MO
Steno bredanensis	Rough-toothed Dolphin			x		MO	MO
Tursiops aduncus	Indian Ocean Bottlenose Dolphin			x	LO	LO	LO

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Tursiops aduncus (Arafura/Timor Sea populations)	Spotted Bottlenose Dolphin (Arafura/Timor Sea populations)		x(M)	x	LO	KO	KO
Tursiops truncatus s. str.	Bottlenose Dolphin			x	MO	MO	MO
Ziphius cavirostris	Cuvier's Beaked Whale			x		MO	MO
Sirenia							
Dugong dugon	Dugong		x(M)	x		BKO	BKO

Threatened Species:

V	Vulnerable
E	Endangered
CE	Critically Endangered

Migratory Species:

M	Marine
W	Wetland
T	Terrestrial

Type of Presence:

MO	Species of species habitat may occur within area
LO	Species or species habitat likely to occur within area
KO	Species or species habitat known to occur within area
FMO	Foraging, feeding or related behaviour may occur within area
FLO	Foraging, feeding or related behaviour likely to occur within area
FKO	Foraging, feeding or related behaviour known to occur within area
BLO	Breeding likely to occur within area
BKO	Breeding known to occur within area
RLO	Roosting likely to occur within area
RKO	Roosting known to occur within area
CKO	Congregation or aggregation known to occur within area

Pygmy Blue Whale

A Foraging and Migration BIA for the pygmy blue whale (*Balaenoptera musculus*) intersects the EMBA (Figure 3-9).

During the northern migration the pygmy blue whales are generally around the Perth Canyon area from January to May prior to transiting north past the North West Cape between April to August. The southern migration typically occurs from October to late-December (DEWHA, 2008c). The migratory path for the pygmy blue whales generally occurs in deeper waters, typically 500–1,000 m (Thums et al., 2022a) with the whales being reported as far as 400 km offshore during their southern migration (McCauley et al., 2018).

Pygmy blue whales appear to feed regularly along their migration route (i.e. at least once per week or more frequently) and are likely to have multiple food caches along their migratory route (e.g. Rowley Shoals and Ningaloo Reef) (ConocoPhillips, 2018).

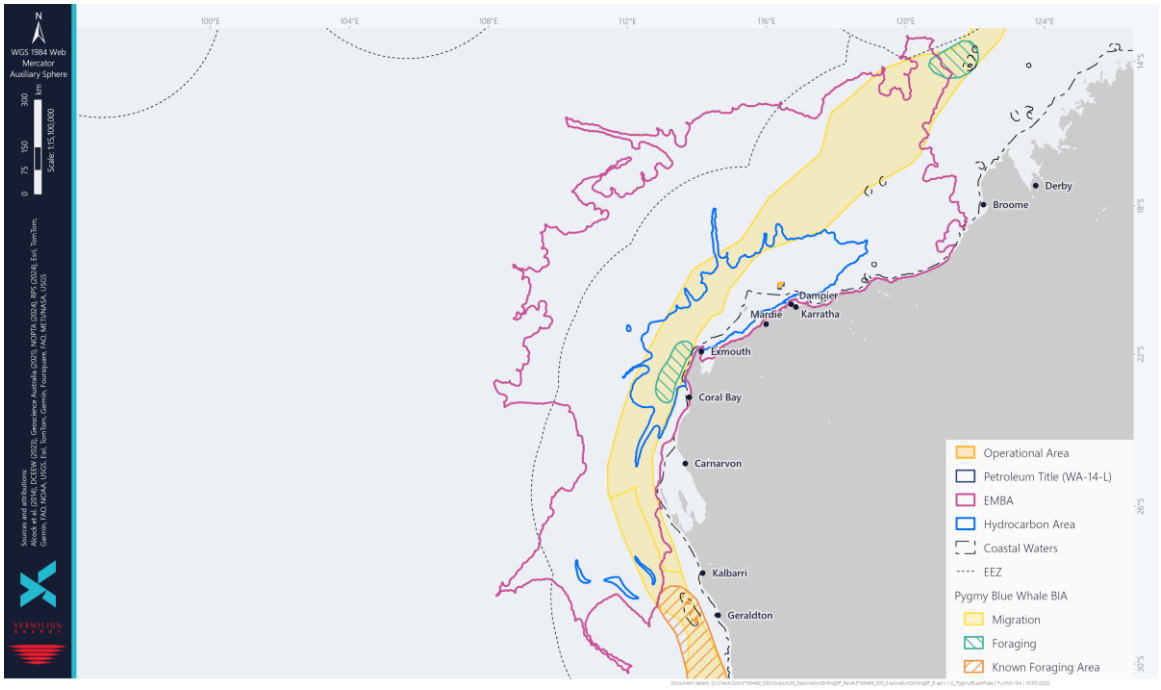
Recognised feeding areas of significance to this species, include Ningaloo Reef (DoE, 2015a). The Ningaloo Reef area has the capacity to offer feeding opportunities to pygmy blue whales

through unique biophysical conditions able to support large biomasses of marine species (Double et al., 2014).

Surface lunge feeding of pygmy blue whales has been observed at North West Cape and Ningaloo Reef in June (Double et al., 2014). Outside of the recognised feeding areas, possible foraging areas for pygmy blue whales include the greater region off Exmouth (DoE, 2015a). The steep gradient features tend to stimulate upwelling and, therefore increased productivity (seasonally variable) (ConocoPhillips, 2018). Hence, they provide a favourable foraging area.

It is likely that migratory individuals may transit through the Operational Area during the north and south bound migratory seasons. Individuals migrating northbound predominantly display fast and direct travel interspersed with short rest periods of low move persistence indicating foraging (Thums et al., 2022).

Figure 3-9: BIAs for the pygmy blue whale



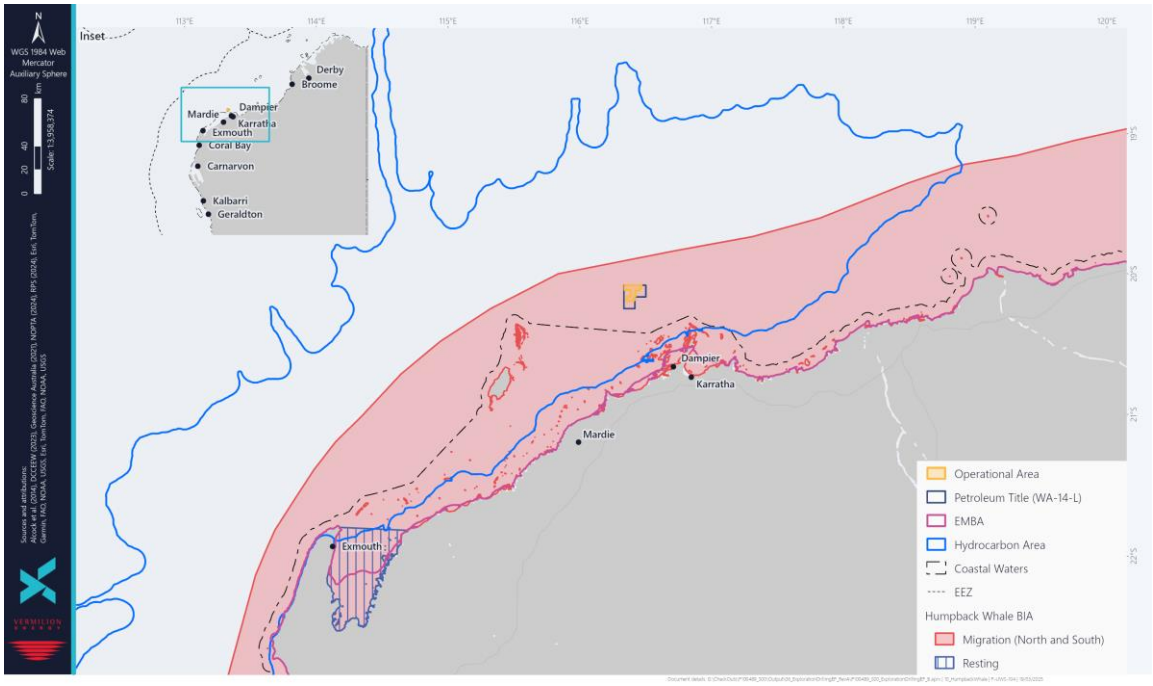
Humpback Whale

The humpback whale (*Megaptera novaeangliae*) has a Migration BIA that intersects the Operational Area and a Resting BIA that intersects the EMBA (Figure 3-10). Listing advice details that the humpback whale is no longer listed as vulnerable and has been removed from the threatened species list. However, the species remains a matter of national environmental significance under the EPBC Act as a Migratory listed species (DCCEEW, 2024p).

The species migrates north through the EMBA from their Antarctic feeding grounds around May each year, reaching the waters of the NWMR in early-June (DoE, 2024b). However, the exact timing of the migration period can vary from year to year. From the North West Cape, northbound humpback whales travel along the edge of the continental shelf passing to the west of the Muiron, Barrow and Montebello Islands, peaking in late July (Jenner et al., 2001).

Breeding and calving grounds are estimated to extend south from Camden Sound to at least North West Cape (Irvine et al., 2018); with breeding and calving occurring between August and September (DEWHA, 2008). This also coincides with the start of the southern migration. Exmouth Gulf and Shark Bay are both important resting areas for migrating humpbacks, particularly for cow-calf pairs on the southern migration (DoE, 2024b). The southerly migration, from around the Lacepede Islands (north of Broome) extends parallel to the coast on approx. the 20–30 m depth contour (Jenner et al., 2001; DoE, 2024b). Southbound migration is more diffuse and irregular, lacking an obvious peak. An increase in southerly migrating individuals may be observed between the North West Cape and the Montebello Islands around November (Jenner et al., 2001).

Figure 3-10: BIAs for the humpback whale



Dugong

A Breeding BIA for the Dugong intersects the EMBA near Exmouth, more than 280 km from the Operational Area. A Foraging BIA also overlaps the EMBA to the far east, more than 550 km from the Operational Area. A significant proportion of the world's dugong (*Dugong dugon*) population occurs in coastal waters from Shark Bay (WA) to Moreton Bay (QLD) (DoE, 2024c). Shark Bay occurs outside of the EMBA and supports a significant population of dugongs, with an estimated 10,000 individuals (DoE, 2024c). Dugongs are also known to feed and migrate through the Northwest Shelf Province, including regions within the Exmouth Gulf, around North West Cape and offshore on the NWS (DoE, 2024c). The Exmouth Gulf dugong population is considered stable and the only one not in decline. Exmouth Gulf is important to this species, as it has been recorded as providing significant breeding and feeding habitat (Jenner and Jenner, 2005). Seagrass meadows are the preferred habitat and food for dugongs; however they are also known to graze on algae and macroinvertebrates (DoE, 2024c).

3.4.3.6 Marine Reptiles

EPBC-Listed marine reptile species presence within the Project Areas is shown in Table 3-5.

Table 3-7 identified BIAs for 4 species that overlap the EMBA and one of those species (flatback turtle) has a BIA within the Operational Area. These species are discussed further below.

Table 3-5: EPBC-listed marine reptile species or species habitat that may occur within the Project Areas

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Marine turtles							
Caretta caretta	Loggerhead Turtle	E	x(M)	x	CKO	BKO	BKO
Chelonia mydas	Green Turtle	V	x(M)	x	CKO	BKO	BKO
Dermochelys coriacea	Leatherback Turtle	E	x(M)	x	LO	FKO	FKO
Eretmochelys imbricata	Hawksbill Turtle	V	x(M)	x	CKO	BKO	BKO
Lepidochelys olivacea	Olive Ridley Turtle	E	x(M)	x			LO
Natator depressus	Flatback Turtle	V	x(M)	x	CKO	BKO	BKO
Sea snakes							
Aipysurus apraefrontalis	Short-nosed Sea Snake	CE		x	LO	KO	KO
Aipysurus duboisii	Dubois' Sea Snake			x	MO	MO	MO
Aipysurus foliosquama	Leaf-scaled Sea Snake	CE		x	KO	KO	KO
Aipysurus laevis	Olive Sea Snake			x	MO	MO	MO
Aipysurus mosaicus	Mosaic Sea Snake			x	MO	MO	MO
Aipysurus pooleorum	Shark Bay Sea Snake			x		MO	MO
Aipysurus tenuis	Brown-lined Sea Snake			x	MO	MO	MO
Emydocephalus annulatus	Eastern Turtle-headed Sea Snake			x	MO	MO	MO
Ephalophis greyae	Mangrove Sea Snake			x	MO	MO	MO
Hydrelaps darwiniensis	Port Darwin Sea Snake			x	MO	MO	MO
Hydrophis czeblukovi	Fine-spined Sea Snake			x	MO	MO	MO
Hydrophis elegans	Elegant Sea Snake			x	MO	MO	MO
Hydrophis hardwickii	Spine-bellied Sea Snake			x			MO
Hydrophis kingii	Spectacled Sea Snake			x	MO	MO	MO
Hydrophis macdowelli	MacDowell's Sea Snake			x	MO	MO	MO
Hydrophis major	Olive-headed Sea Snake			x	MO	MO	MO
Hydrophis ornatus	Spotted Sea Snake			x	MO	MO	MO
Hydrophis peronii	Horned Sea Snake			x	MO	MO	MO
Hydrophis platura	Yellow-bellied Sea Snake			x	MO	MO	MO

Scientific name	Common name	EPBC Act status			Project Areas		
		Threatened Species	Migratory Species	Listed Marine Species	Operational Area	Hydrocarbon Area	EMBA
Hydrophis stokesii	Stokes' Sea Snake			x	MO	MO	MO
Crocodile							
Crocodylus porosus	Salt-water Crocodile		x(M)	X	MO	MO	LO

Threatened Species:		Type of Presence:	
V	Vulnerable	MO	Species of species habitat may occur within area
E	Endangered	LO	Species or species habitat likely to occur within area
CE	Critically Endangered	KO	Species or species habitat known to occur within area
		FMO	Foraging, feeding or related behaviour may occur within area
		FLO	Foraging, feeding or related behaviour likely to occur within area
		FKO	Foraging, feeding or related behaviour known to occur within area
Migratory Species:			
M	Marine	BLO	Breeding likely to occur within area
W	Wetland	BKO	Breeding known to occur within area
T	Terrestrial	RLO	Roosting likely to occur within area
		RKO	Roosting known to occur within area
		CKO	Congregation or aggregation known to occur within area

Flatback Turtle

The flatback turtle (*Natator depressus*) (Figure 3-11) has a Reproduction BIA that intersects with the Operational Area and an Aggregation, Foraging, and a Migration BIA that intersects with the EMBA.

The flatback turtle has an Australasian distribution, with all recorded nesting beaches occurring within tropical to sub-tropical Australian waters. One third of the total breeding for the species occurs in Western Australia (WA) (Limpus, 2007). The Pilbara stock nests throughout the North West Shelf and is characterised by summer nesting (October to March) (CoA, 2017). On the North West Shelf, significant rookeries are centred on Barrow Island especially the east coast beaches (DSEWPaC, 2012a). Montebello Islands, Thevenard Island, Varanus Island, the Lowendal Islands, King Sound and Dampier Archipelago are also significant rookeries (Pendoley, 2005; Limpus, 2007; Pendoley Environmental, 2011).

Delambre Island is an important turtle rookery for flatback turtles with an estimated population size of approximately 2,700-3,900 nesting females per season and nesting from late October to mid-February (Thums et al., 2020). There have also been occasional records of nesting by flatback turtles on the Jurabi Coast and Muiron Islands (CALM, 2005). During turtle surveys for Santos, WA flatback turtle nesting was recorded on Bessieres Islands (Astron, 2014), Serrurier, Flat, Table and Round Island in previous surveys (Pendoley Environmental, 2009). Previously the status of the flatback population(s) was undetermined and although not well quantified, it was estimated to be many thousands of females (Limpus, 2007). However, Pendoley et al. (2014)

reported both Barrow Island and Mundabullangana flatback turtles as substantial reproductive populations with estimates of 1,512 and 1,461 nesting females annually respectively.

Flatback turtles are thought to return to the same small beach for successive clutches both within and between seasons (Bannister et al., 2016; Thums et al., 2020). Thums et al. (2020) identified 4,369 sightings of tagged flatback turtles that were sited more than once at Delambre Island during beach monitoring between November-January from 2010-2016. About 40% of the turtles identified to revisit Delambre Island occurred during an interval of 2 years (Thums et al., 2020).

Satellite tracking of adult (female) flatback turtles shows they use a variety of inshore and offshore marine areas off the east and west coasts of Barrow Island. Females inter-nest close to their nesting beaches, typically in 0–10 m of water (Chevron, 2008). However, flatback turtles also travel approximately 70 km and inter-nest in shallow nearshore water off the adjacent mainland coast, before returning to Barrow Island to lay another clutch of eggs. The average inter-nesting period is 13–16 days.

From long-term tagging studies on Varanus Island and Pendoley's observations, it appears that the nesting season for flatback turtles' peaks in December and January with subsequent peak hatchling emergence in February and March. Flatbacks have been observed to nest on Varanus Island between November and February (Chevron, 2008; Pendoley Environmental, 2011; Pendoley Environmental, 2013). Population monitoring of flatback turtles on Varanus Island, calculated from 16 seasons, indicates a mean population estimate of 226 (+/- 97). Modelled flatback turtle populations have shown a slight decline from 2008/09 to 2016/17, which is considered to be part of fluctuations in the natural cycle (Astron, 2017). Flatback turtles tend to nest on all beaches on Varanus Island (Astron, 2017). Flatback hatching and emergence success is noted as higher compared to that reported for other Western Australian rookeries (Pendoley et al., 2014).

Green Turtle

The green turtle (*Chelonia mydas*) has an Aggregation, Reproduction, Resting, and Migration BIA that intersects with the EMBA (Figure 3-11).

The North West Shelf population of green turtles is one of the largest in the world and the most significant rookery is the western side of Barrow Island (Prince, 1994; Limpus, 2008a). Other principal rookeries include the Lacepede Islands, Montebello Islands, Dampier Archipelago, Browse Island and North West Cape (Prince, 1994; Limpus, 2008a; DSEWPaC, 2012d).

Surveys by Waayers (2010) within the Ningaloo Marine Park and Muiron Islands Marine Management Area estimated up to 7,500 female green turtles used these areas. In 2014, Santos commissioned a survey of the islands in the Exmouth Region which found that North and South Muiron Islands were significant nesting sites for green turtles with over 100 green turtles nesting overnight on one beach at North Muiron Island (Astron, 2014). The green turtle is also known to breed in large numbers in the dunes above the extensive beaches found on Serrurier Island, with counts indicating the island supports the second largest rookery in the Pilbara (Oliver, 1990).

The green turtle is one of the more predominant species nesting in the Pilbara region (Pendoley et al., 2016). In the Pilbara region, the species nest over ~4-6 months with internesting intervals

varying among location (Pendoley et al., 2016). Green turtle nesting abundance and timing fluctuates significantly from year to year depending on environmental variables, locality and food availability (Pendoley Environmental, 2011). Nesting activity is primarily located on outer islands away from mainland coastline (Pendoley et al., 2016). Pendoley et al. (2016) recorded 55 nesting green turtles at 36% of all survey locations at Port Hedland, Onslow, Dampier, and Barrow Group between 1992-2012.

Nesting of green turtles has been recorded from August to March on Serrurier Island (Woodside, 2002) and from October to February on Varanus Island (Pendoley Environmental, 2011). On Barrow Island, mating aggregations may commence from October with peak nesting from December to January, with hatchlings emerging through summer and early autumn. However, nesting on Barrow Island has been recorded all year round (Chevron, 2005; Chevron, 2008; Pendoley, 2005).

Green turtles spend the first five to ten years of their life drifting on ocean currents, before moving to reside in shallower benthic habitats, including tropical coral and rocky reefs and seagrass beds. Green turtles have been known to migrate more than 2,600 km between feeding and breeding grounds (Limpus, 2008a).

Hawksbill Turtle

The hawksbill turtle (*Eretmochelys imbricate*) has a Reproduction, Foraging, and Migration BIA that intersects with the EMBA (Figure 3-11).

Hawksbill turtles (*Eretmochelys imbricata*) have a global distribution throughout tropical and sub-tropical marine waters. The Western Australian stock is concentrated on the North West Shelf (Dampier Archipelago) (Limpus, 2009) and is considered to be one of the largest hawksbill populations remaining in the world. In WA, their nesting range is relatively small and extends from the Muiron Islands to the Dampier Archipelago, a distance of approximately 400 km. The most significant breeding areas, that support hundreds of nesting females annually, are around sandy beaches within the Dampier Archipelago, Montebello Islands, Lowendal Islands and Barrow Island (Pendoley, 2005; Limpus, 2009).

The largest known nesting area for the North West Shelf population is the sandy shoreline of Rosemary Island, within the EMBA, particularly on the north-western side of the Island. The Rosemary Island rookery may support up to 1,000 nesting females annually (Limpus, 2009). Low density nesting is also known from Barrow Island, Airlie Island, Muiron Islands and North West Cape/ Ningaloo coast (Cape Range) (Limpus, 2009a). Hawksbill turtles have been observed breeding on the North West Shelf between July and March with peak nesting activity around the Lowendal Islands between October and December (Limpus, 2009a).

On Varanus Island, hawksbill turtle nesting activity is predominantly distributed on the island's east coast, including Pipeline, Harriet, and Andersons beaches (Pendoley Environmental, 2019). Individual hawksbill turtles appear to show a strong fidelity to these beaches, often returning to the same beach to nest within the season (Pendoley Environmental, 2019). Between 1986 and 2019, a total of 571 individual hawksbill turtles were tagged on Varanus Island. Recent baseline data was collected at the Montebello and Dampier AMPs by Keesing, 2019 showing that only one hawksbill turtle was identified during the survey at the Dampier AMP only. No marine turtle species were identified during the survey at Montebello AMP.

Individuals may migrate up to 2,400 km between their nesting and foraging grounds (DSWEPaC, 2012c), however a recent tagging study showed that turtles migrating from WA rookeries remain on the continental shelf (< 200 m depth) and within Australian waters during their inter-nesting, migrating and foraging phases (Fossette et al., 2021). Satellite tracking of nesting turtles on Varanus Island (32 km) and Rosemary Island has shown adult turtles to feed between 50 and 450 km from their nesting beaches (DSWEPaC, 2012a).

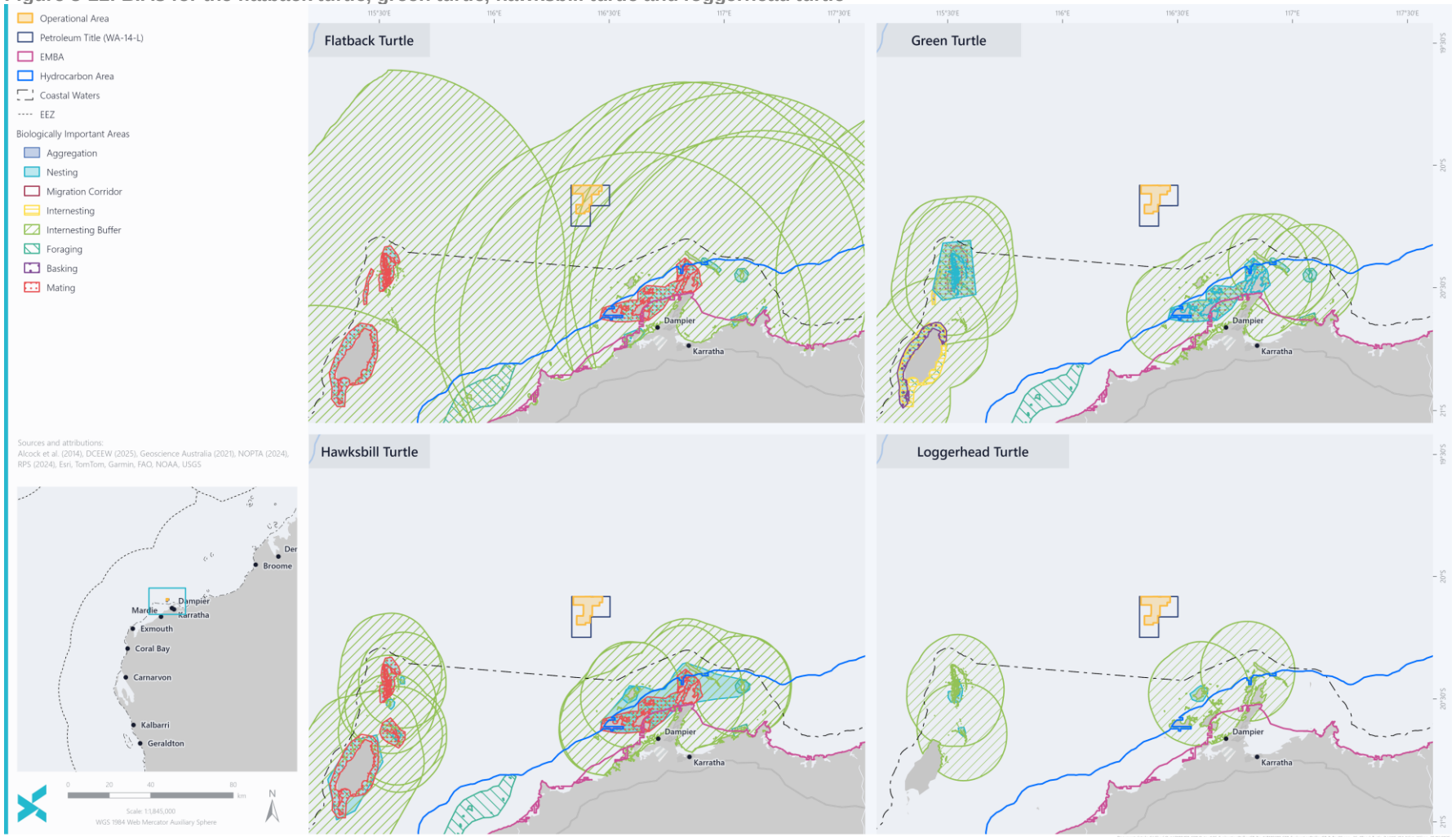
Adults tend to forage in tropical tidal and sub-tidal coral and rocky reef habitat where they feed on an omnivorous diet of sponges, algae, jelly fish and cephalopods (DSWEPaC, 2012a). Hawksbill turtles are unlikely to spend significant time within offshore waters as it is too deep to act as a feeding ground. However, it is likely they may migrate through those areas. A Foraging BIA was identified within the EMBA; however, the existing BIA does not include the majority of foraging areas calculated (AIMS, 2021). While approximately 23% of the hawksbill turtles foraging distribution occurred within MPAs, the existing BIAs are largely underestimating the important foraging areas for the turtles (AIMS, 2021). This supports the results of a joint study conducted by Fossette et al. (2021), which found only 10% of foraging areas utilised by 42 nesting turtles (between 2000 and 2017) were encompassed by the designated foraging BIA. Fossette et al. (2021) found that the highest overlap of individual turtles occurred within the Migratory BIA corridor.

Loggerhead Turtle

A Reproduction BIA for the loggerhead turtle (*Caretta caretta*) intersects the EMBA (Figure 3-11). The Recovery Plan for Marine Turtles in Australia (2017) identifies the Muiron Islands (as a principal rookery), and all waters within a 20 km radius as habitat critical to the survival of loggerhead turtles (CoA, 2017). The Muiron Islands, within the EMBA, is one of the major nesting locations (Limpus, 2008a).

Estimates of up to 5,000 female loggerhead turtles have been predicted within the Ningaloo Marine Park and Muiron Islands Marine Management Area (Waayers, 2010). Loggerhead nesting and breeding occurs from November to March, with a peak in late December/early January (Limpus, 2008b).

Figure 3-11: BIAs for the flatback turtle, green turtle, hawksbill turtle and loggerhead turtle



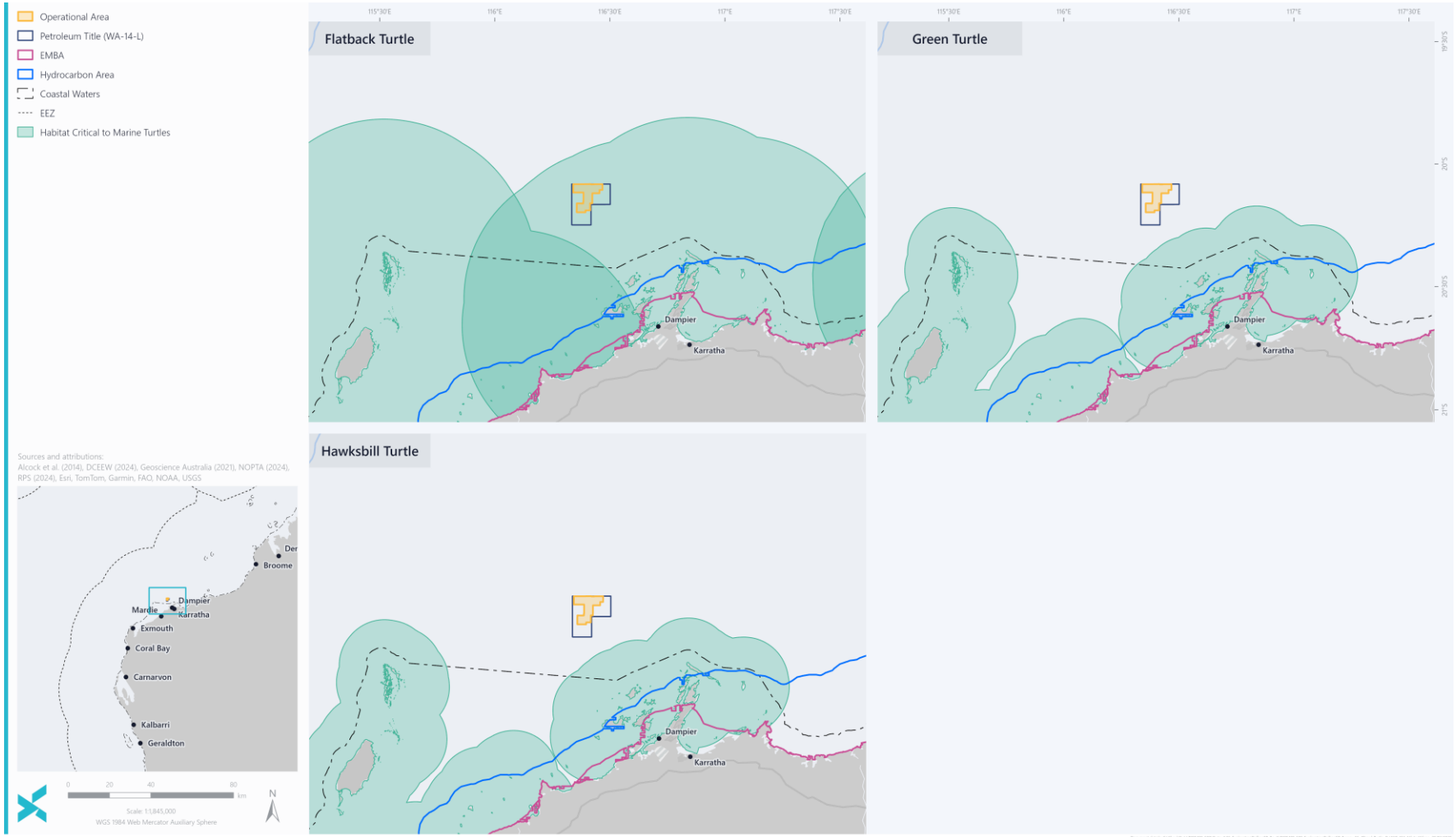
Habitat Critical to Survival of Marine Turtles

Habitat critical to the survival of the green turtle, loggerhead turtle, leatherback turtle and the hawksbill turtles located within the EMBA are described in Table 3-6. Habitat critical for the flatback turtle, green turtle, and hawksbill turtle is shown in Figure 3-12.

Table 3-6: Habitat critical to the survival of marine turtles occurring within the EMBA

Species	Genetic stock	Nesting locations	Approximate distance and direction from Operational Area (km)	Inter-nesting buffer	Nesting period	Hatching period
Flatback Turtle	Pilbara	Barrow Island, Montebello Islands, coastal islands from Cape Preston to Locker Island	13.7 km SSW	60 km	Oct–Mar (peak: Nov–Jan)	Feb–Mar
		Cemetary Beach, Port Hedland	169 km ESE			
		Dampier Archipelago, including Delambre Island and Hauy Island	Overlap			
		Eco Beach - coastal beach near Broome	560 km ENE			
		Eighty mile beach - coastal beach	288 km ENE			
		Mundabullangana Beach	100 km ESE			
Green Turtle	NWS	Barrow Island, Montebello Islands, Serrier Island and Thevenard Island	53.7 km SSW	20 km	Nov–Mar (peak: Dec–Feb)	Jan–May (peak: Feb–Mar)
		Dampier Archipelago	14.2 km SSE			
		Exmouth Gulf and Ningaloo coast	256.7 km SSW			
Hawksbill Turtle	WA	Cape Preston to mouth of Exmouth Gulf including Montebello Islands and Lowendal Islands	53.7 km SSW	20 km	All year (peak: Oct–Jan)	All year (peak: Dec–Feb)
		Dampier Archipelago, including Delambre Island and Rosemary Island	14.2 km SSE			
Loggerhead Turtle	WA	Exmouth Gulf and Ningaloo coast	256.7 km SSW	20 km	Nov–Mar (peak: Jan)	Jan–May
		Gnaraloo Bay and beaches	455 km SSW			
		Shark Bay, all coastal and island beaches out to the northern tip of Dirk Hartog Island	636.8 km SSW			

Figure 3-12: Habitat critical to the survival of the flatback turtle, green turtle and hawksbill turtle



3.4.4 Biologically Important Areas

Table 3-7 describes BIAs that intersect with the Operational Area, Hydrocarbon Area and EMBA. While the key source of information about which BIAs may be present in the Project Areas is the EPBC Act PMST (Appendix C), some BIAs that appear in the PMST reports are later determined not to have a spatial overlap with the Project Areas, based on geospatial data.

Table 3-7: BIAs within the Operational Area, Hydrocarbon Area and EMBA

Species	BIA presence			Summary description of BIA
	EMBA	Hydrocarbon Area	Operational Area	
Birds				
Bridled tern (*Sterna anaethetus*)	f	f	-	Oceanic foraging grounds with presence generally driven by breeding season, late-September to late-February/ early-May.
Brown booby (*Sula leucogaster*)	b	f	-	Breeding grounds and buffer area around offshore islands in Pilbara and Kimberley (including Bedout Island). Breeding presence may occur February to October.
Fairy tern (*Sterna nereis*)	br	br	-	Breeding grounds and buffer area around offshore islands in Gascoyne and Pilbara. Breeding may occur late-July to September.
Lesser crested tern (*Thalasseus bengalensis*)	br	br	-	Breeding grounds and buffer area around offshore islands in Gascoyne, Pilbara and Kimberley (including Lowendal Islands and Bedout Island). Breeding may occur March to June.
Lesser frigatebird (*Fregata ariel*)	br	br	-	Breeding grounds and buffer area around offshore islands in the Pilbara and Kimberley (including Bedout Island). Breeding season from March to September.
Little shearwater (*Puffinus assimilis*)	f	f	-	Oceanic foraging grounds extend 4 – 200km offshore between Kalbarri and Eucla, with high usage around Abrolhos Islands. Presence mainly occurs April to November.
Little tern (*Sternula albifrons*)	br,r	-	-	Breeding grounds and buffer area and resting areas, around offshore islands in Pilbara and Kimberley. Breeding has been recorded June to October.
Roseate tern (*Sterna dougallii)*	br,f,r	br	-	Breeding grounds and buffer area around offshore islands in Gascoyne, Pilbara and Kimberly. Breeding presence may occur mid-March to July.

Species	BIA presence			Summary description of BIA
	EMBA	Hydrocarbon Area	Operational Area	
				Oceanic foraging grounds on west coast and round Abrolhos Islands. Resting area located northern end of Eighty Mile Beach.
Sooty tern (*Sterna fuscata*)	f	f	-	Oceanic foraging grounds; common in Abrolhos area but in small numbers. Presence associated with breeding season from late-August to early-May.
Wedge-tailed shearwater (*Ardenna pacifica*)	br,f	br,f	br	Breeding grounds and buffer area around offshore islands including Bedout Island, Dampier Archipelago, Forestier Islands, Montebello and Lowendal Islands. Breeding presence may occur between mid-August to April (Pilbara) or to mid-May (Shark Bay).
White-faced storm-petrel (*Pelagodroma marina*)	f	f	-	Foraging in offshore areas of the south-west marine region and into the adjacent south-east marine region and the north-west marine region to north of Shark Bay.
White-tailed tropicbird (*Phaethon lepturus*)	br	br	-	Breeding grounds and buffer area around offshore islands in the Pilbara and Kimberley (including Rowley Shoals). Breeding recorded between May and October.
Fish, sharks and rays				
Dwarf sawfish (*Pristis clavate*)	n,fp	-	-	Inshore foraging, pupping and nursery area along Eighty Mile Beach with nursery area at Fitzroy River Mouth, May and Robinson River.
Freshwater sawfish / largetooth sawfish(*Pristis pristis*)	f,p	-	-	Foraging and pupping at 80 Mile Beach. Pupping occurs from late January to May.
Green sawfish (*Pristis zijsron*)	f,n,p	-	-	Foraging, nursing and pupping occurs at Cape Keraudren and 80 Mile Beach. The movements of this species are tidally influenced and occupy a restricted range of only a few km within the coastal fringe.
Whale shark (*Rhincodon typus*)	f	f	f	Aggregation occurs in Ningaloo due to seasonal concentrations of krill and other zooplankton which whale sharks forage upon.
Marine mammals				
Dugong (*Dugong dugon*)	br,c,f,n	br,c,f,n	-	Breeding, calving, nursing and foraging grounds within the Exmouth Gulf and North West Cape regions. Presence may occur throughout the year.

Species	BIA presence			Summary description of BIA
	EMBA	Hydrocarbon Area	Operational Area	
				Presence in Shark Bay BIAs may be more seasonal, between April and November.
Humpback whale (*Megaptera novaeangliae*)	c,m,r	m,r	m	Migration corridor extends out to ~50–100 km from the coast. Migration along the WA coast occurs between May and late November. Winter resting areas identified within Exmouth Gulf and Shark Bay. Calving ground extending from Camden Sound to North West Cape.
Pygmy blue whale (*Balaenoptera musculus*)	f,m	d,f,m	d	Offshore migration corridor, typically along shelf-edge at depths 500–1,000 m, occurring close to the coast around Exmouth. Presence may occur during northern migration past Exmouth area during April to August (whereas January to May past Perth Canyon area). Southern migration presence may occur October to late-December. Foraging along outer continental shelf from Cape Naturaliste to south of Jurien Bay (Nov-June, with peak in March-May).
Marine reptiles				
Loggerhead turtle (*Caretta caretta*)	f,ib,n	ib,n	-	Nesting and internesting areas around rookeries, including Lowendal and Montebello islands, Ningaloo Coast, Muiron and Dampier Archipelago. Oceanic foraging area between De Grey River and Bedout Island may be use throughout the year by multiple turtle species.
Green turtle (*Chelonia mydas*)	a,b,f,i,b,ma,m,n	a,b,f,i,ib,ma,m,n	-	Nesting and internesting areas and rookeries including Barrow and Montebello Islands, North West Cape and Dampier Archipelago. Oceanic foraging grounds around the inshore islands between Cape Preston and Onslow; and De Grey River and Bedout Island.
Hawksbill turtle (*Eretmochelys imbricate*)	f,i,b,ma,m,n	f,i,ib,ma,m,	-	Nesting and internesting areas around rookeries, including Montebello and Lowendal Islands, Ningaloo Coast, Thevenard, Barrow and Dampier Archipelago. Oceanic foraging area around the inshore islands between Cape Preston and Onslow; and De Grey River and Bedout Island.

Species	BIA presence			Summary description of BIA
	EMBA	Hydrocarbon Area	Operational Area	
Flatback turtle (*Natator depressus*)	a,f,i,ib,ma,m,n	a,f,i,l,b,ma,m,n	i	Nesting and internesting areas around rookeries, including Barrow and Montebello Islands, Thevenard (and other Pilbara inshore islands) and Dampier Archipelago with the potential for presence during summer. Oceanic foraging area around the inshore islands between Cape Preston and Onslow; and De Grey River and Bedout island.

Biologically Important Areas

a	Aggregation
b	Basking
br	Breeding
c	Calving and/or Nursing
f	Foraging
d	Distribution
i	Internesting buffer
ib	Internesting
m	Migration
ma	Mating
n	Nesting
p	Pupping and/or Juvenile
r	Resting
n	Nursing

3.5 Social and Economic Environment

Table 3-1 identifies that social and economic receptors within the Operational Area, Hydrocarbon Area and EMBA may be relevant to aspects of the exploration drilling activities. The descriptions below provide sufficient details to assess all impacts and risks to the social and economic environment.

3.5.1 Fisheries and Aquaculture

Table 3-8 identifies the Commonwealth and State managed fisheries that have a defined management area or historical catch data overlapping the Operational Area and the EMBA. The description below provides sufficient details to assess all impacts and risks to Commonwealth and State managed fisheries.

Commonwealth fisheries are those managed by the Australian Fisheries Management Authority (AFMA) and typically extend from 3 nm to 200 nm which is the extent of the Australian Fishing Zone (AFZ). Commonwealth-managed fisheries data includes fishing intensity from 2010 to 2022

provided by the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) (Summerson, 2024).

There are four Commonwealth managed commercial fisheries that have a defined management area overlapping the Operational Area. Of which, zero have historical fishing intensity intersecting the Operational Area.

Western Australian fisheries are managed by the WA Department of Primary Industries and Regional Development (DPIRD). State-managed fisheries in WA includes maximum vessel count over 10 years (2013 to 2023) within 10NM and 60NM CAES blocks provided by FishCube Data (DPIRD, 2023).

FishCube database indicates there are a total 11 WA-managed commercial fisheries that have a defined management area overlapping the Operational Area. There are a total 12 WA-managed commercial fisheries that have historical fishing effort overlapping the Operational Area. These fisheries are listed below.

Fisheries with active fishing effort recorded within the past 5 year period (2018 to 2023) are displayed in figures from Figure 3-13 to Figure 3-35.

Through consultation with WAFIC (Section 9.3.2), the following State-managed fisheries were identified as relevant for consultation:

- Mackerel Managed Fishery
- Pilbara Fish Trawl Managed Fishery
- Pilbara Trap Managed Fishery
- Pilbara Line Fishery (Condition)
- Onslow Prawn Managed Fishery
- Pilbara Crab Managed Fishery.

Table 3-8: Management areas for Commonwealth and WA managed fisheries within the Operational Area, Hydrocarbon Area and EMBA

Commercial Fishery	Operational Area	Hydrocarbon Area	EMBA	Fishing Effort	Figure
Commonwealth Managed Fisheries					
North West Slope Trawl Fishery	*X*	✓	✓(a)	Low to medium fishing effort (<0.25 – 0.5 hours/km^2) recorded in reporting grids within the EMBA, with high fishing effort (0.5-1.0 hours/km^2) recorded in grid 3 within the EMBA during the 2019-2020 season. The management area intersects the Hydrocarbon Area and EMBA.	Figure 3-13
Southern Bluefin Tuna Fishery	✓	✓	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	-
Southern Tuna and Billfish Fishery	✓	✓	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	-
Western Deepwater Trawl Fishery	*X*	✓	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the Hydrocarbon Area and EMBA.	-
Western Skipjack Tuna Fishery	✓	✓	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	-
Western Tuna and Billfish Fishery	✓	✓	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	-

Commercial Fishery	Operational Area	Hydrocarbon Area	EMBA	Fishing Effort	Figure
WA State Managed Fisheries					
Abalone Managed Fishery	✓	✓	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	-
Abrolhos Islands and Mid West Trawl Managed Fishery	*X*	*X*	*X*(a)	Up to 4 vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the EMBA. The management does not intersect the EMBA, which indicates fishing activity is unlikely in the EMBA given only vessel activity is reported within the 60 nm CAES blocks that intersects the EMBA.	Figure 3-13
Broome Prawn Managed Fishery	*X*	*X*	✓(a)	Less than three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the EMBA. The management area intersects the EMBA.	Figure 3-15
Exmouth Gulf Beach Seine and Mesh Net Managed Fishery*	*X*	*X*	✓(a)	Less than three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the EMBA. There is no defined management area for this fishery.	Figure 3-16
Exmouth Gulf Prawn Managed Fishery	*X*	✓(a)	✓(a)	Up to 7 vessels active between 2013 and 2023 within the 10 nm and 60 nm CAES blocks that intersect the Hydrocarbon Area and EMBA. The management area intersects the Hydrocarbon Area and EMBA.	Figure 3-17
FBL Condition 74 Fish Trapping*	*X*	*X*	(a)	Less than three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the EMBA. Fishery last active in 2019. There is no defined management area for this fishery.	Figure 3-18
Gascoyne Demersal Scalefish Managed Fishery	*X*	✓(a)	✓(a)	Up to 7 vessels active between 2013 and 2023 within the 10 nm CAES blocks that intersect the Hydrocarbon Area and EMBA.	Figure 3-21

Commercial Fishery	Operational Area	Hydrocarbon Area	EMBA	Fishing Effort	Figure
				The management area intersects the Hydrocarbon Area and EMBA.	
Hermit Crab Fishery*	(a)	(a)	(a)	Less than three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Operational Area, Hydrocarbon Area and EMBA. There has been no fishing effort recorded in the 5 year period 2018-2023. There is no defined management area for this fishery.	-
Kimberley Crab Managed Fishery	*X*	*X*	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the EMBA.	-
Kimberley Gillnet and Barramundi Limited Entry Fishery	*X*	*X*	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the EMBA.	-
Mackerel Managed Fishery	✓(a)	✓(a)	✓(a)	Up to five vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	Figure 3-27
Marine Aquarium Fish Managed Fishery	✓(a)	✓(a)	✓(a)	Up to seven vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Operational Area. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	Figure 3-22
Nickol Bay Prawn Fishery*	✓(a)	✓(a)	✓(a)	Up to eight vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Operational Area. There is no defined management area for this fishery.	Figure 3-27

Commercial Fishery	Operational Area	Hydrocarbon Area	EMBA	Fishing Effort	Figure
Northern Demersal Scalefish Managed Fishery	*X*	*X*	✓(a)	Up to three vessels active between 2013 and 2023 within the 10 nm CAES blocks and up to six vessels active within the 60 nm CAES block that intersect the EMBA. The management area intersects the EMBA.	Figure 3-25
Octopus Interim Managed Fishery	*X*	✓	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the EMBA.	-
Onslow Prawn Limited Entry Fishery	✓(a)	✓(a)	✓(a)	Less than three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Operational Area, Hydrocarbon Area and EMBA. Last active in 2021–2022. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	Figure 3-27
Open Access (North Coast, Gascoyne Coast and West Coast Bioregions)*	*X*	✓	✓(a)	Less than 3 vessels active between 2018 and 2023 within 60 nm CAES block within the EMBA. Fishery was last active in 2020. There is no defined management area for this fishery.	Figure 3-23
Pearl Oyster Managed Fishery*	*X*	✓(a)	✓(a)	Less than three vessels active between 2018 and 2023 within the 60 nm CAES blocks that intersect the Hydrocarbon Area. There is no defined management area for this fishery.	Figure 3-24
Pilbara Crab Managed Fishery	✓(a)	✓(a)	✓(a)	Less than three vessels active between 2018 and 2023 within the 60 nm CAES blocks that intersect the Operational Area. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	Figure 3-26

Commercial Fishery	Operational Area	Hydrocarbon Area	EMBA	Fishing Effort	Figure
Pilbara Fish Trawl Interim Managed Fishery	✓(a)	✓(a)	✓(a)	Up to four vessels active between 2013 and 2023 in the Operational Area in the 10 nm CAES block. The management area intersects the Operational Area, Hydrocarbon area and EMBA.	Figure 3-28
Pilbara Line Fishery (Condition)*	(a)	(a)	(a)	Less than three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Operational Area. Last active in 2019–2020. There is no defined management area for this fishery.	Figure 3-29
Pilbara Trap Managed Fishery	✓(a)	✓(a)	✓(a)	Up to three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Operational Area. The management area intersects the Operational Area, Hydrocarbon Area and EMBA..	Figure 3-30
Shark Bay Crab Managed Fishery	*X*	✓(a)	✓(a)	Up to 20 vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Hydrocarbon Area. The management area intersects the Hydrocarbon Area and EMBA.	Figure 3-32
Shark Bay Prawn Managed Fishery	*X*	✓(a)	✓(a)	Up to 18 vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Hydrocarbon Area. The management area intersects the Hydrocarbon Area and EMBA.	Figure 3-33
Shark Bay Scallop Limited Entry Fishery	*X*	✓(a)	✓(a)	Up to 16 vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Hydrocarbon Area. The management area intersects the Hydrocarbon Area and EMBA.	Figure 3-34

Commercial Fishery	Operational Area	Hydrocarbon Area	EMBA	Fishing Effort	Figure
South-west Coast Salmon Fishery	✓	✓	✓	No fishing effort recorded within the Operational Area, Hydrocarbon Area and EMBA. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	-
Specimen Shell Managed Fishery	✓(a)	✓(a)	✓(a)	Up to three licences active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Operational Area. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	Figure 3-27
Tour Operator*	✓(a)	✓(a)	✓(a)	Less than three licences active in the Operational Area between 2013 and 2023 within in the 10 nm CAES block. Up to seven licences active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Operational Area. There is no defined management area for this fishery.	Figure 3-35
West Coast Deep Sea Crustacean Managed Fishery	✓	✓(a)	✓(a)	Up to three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Hydrocarbon Area and EMBA. The management area intersects the Operational Area, Hydrocarbon Area and EMBA.	Figure 3-23
West Coast Demersal Gillnet and Demersal Longline Interim Managed Fishery	*X*	✓	✓	No fishing effort recorded in the Operational Area. No fishing effort has been recorded in the EMBA since 2016. The management area intersects the Hydrocarbon Area and EMBA.	-
West Coast Demersal Scalefish (Interim) Managed Fishery	*X*	✓(a)	✓(a)	Up to three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Hydrocarbon Area. The management area intersects the Hydrocarbon Area and EMBA.	Figure 3-19

Commercial Fishery	Operational Area	Hydrocarbon Area	EMBA	Fishing Effort	Figure
West Coast Rock Lobster Managed Fishery	*X*	✓(a)	✓(a)	Up to three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersect the Hydrocarbon area. The management area intersects the Hydrocarbon Area and EMBA.	Figure 3-31
Western Australian Sea Cucumber Fishery*	(a)	(a)	(a)	Less than three vessels active between 2013 and 2023 within the 60 nm CAES blocks that intersects the Operational Area. There is no defined management area for this fishery.	Figure 3-28
✓= Management area present within area; X = Management area not present within area (a) = Active fishing intensity recorded between 2018 to 2023 * does not have a defined management area					

Figure 3-13: Commonwealth North West Slope Trawl Fisheries activity in the vicinity of the Operational Area

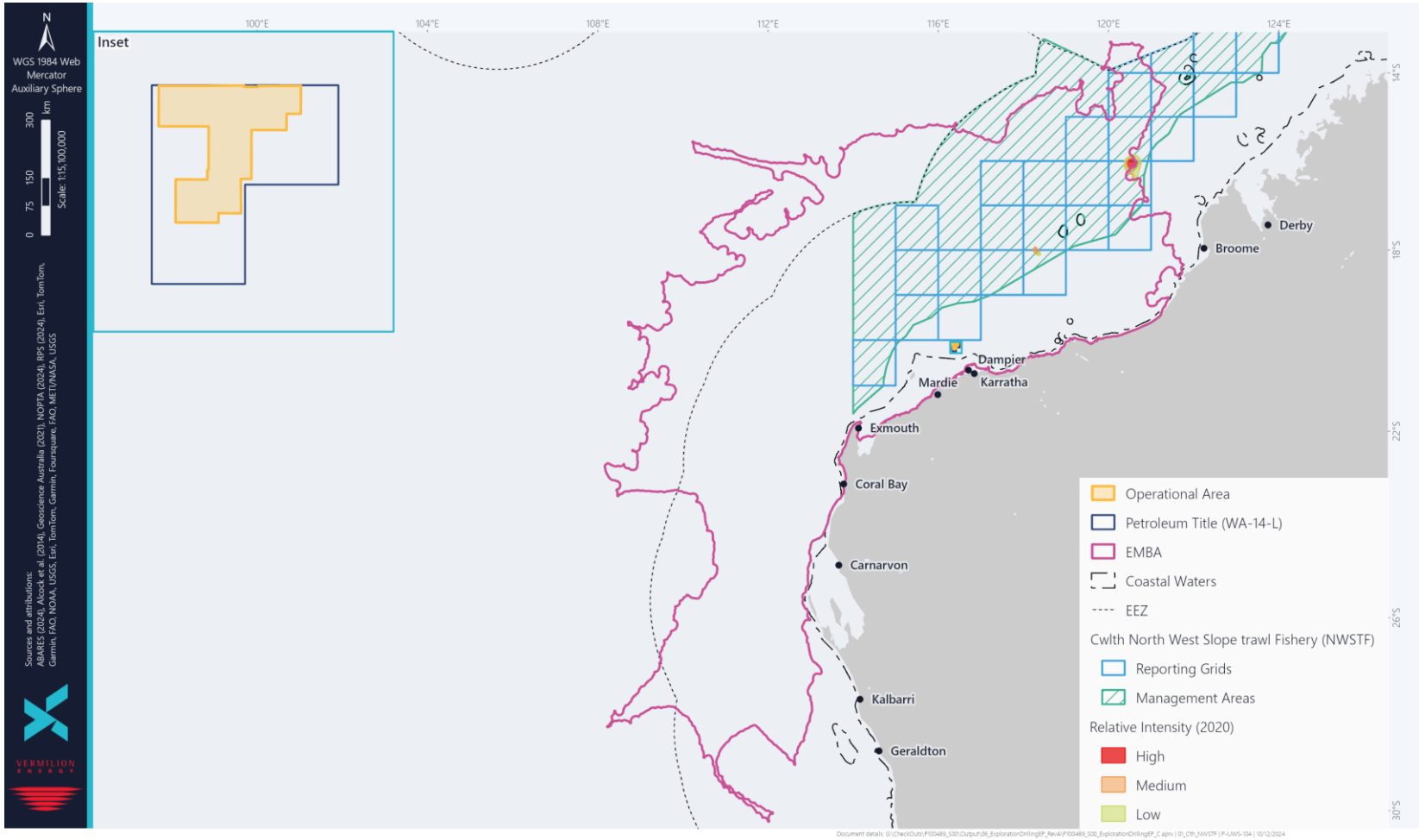


Figure 3-14: Abrolhos Islands and Mid West Trawl Managed Fisheries activity in the vicinity of the Operational Area

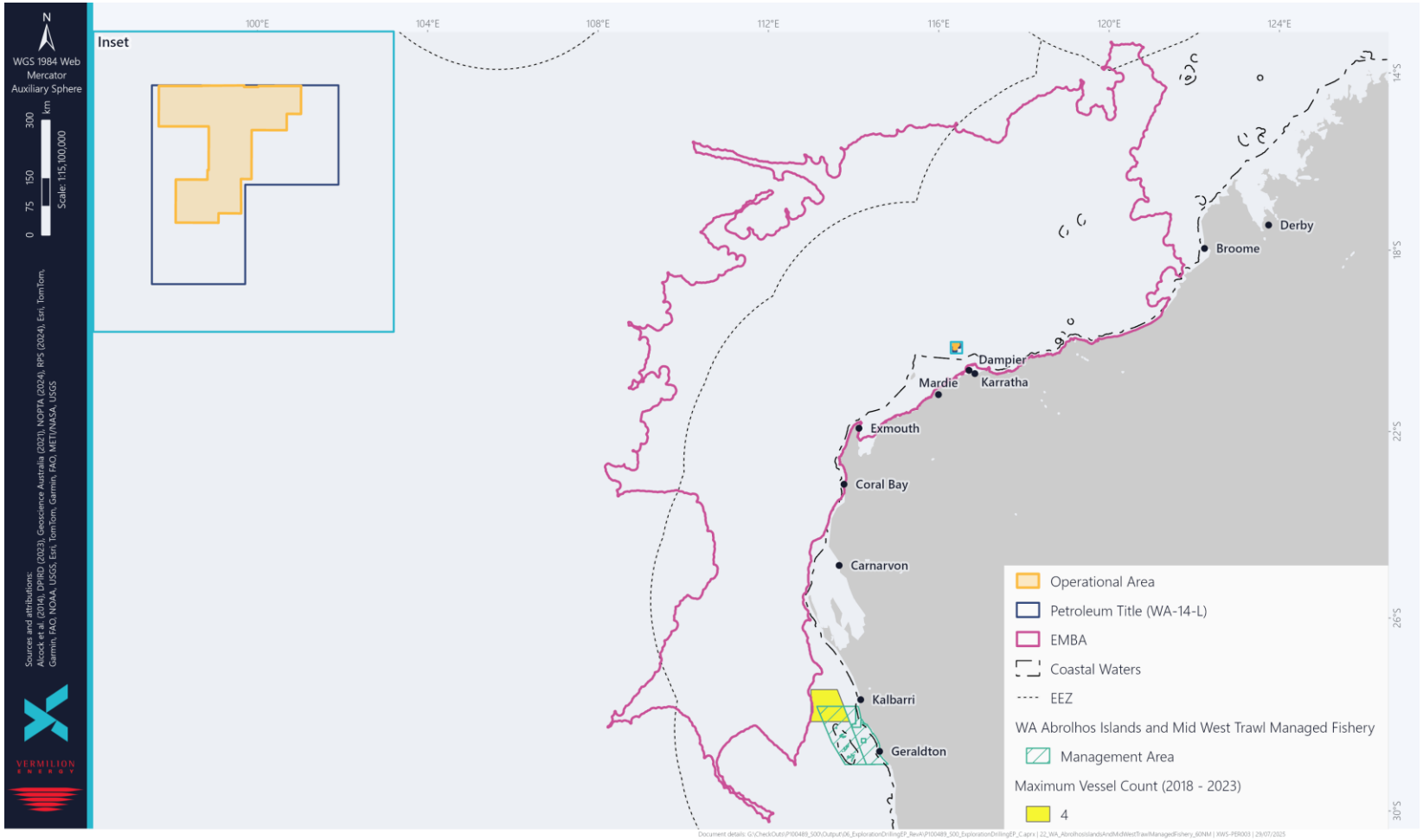


Figure 3-15: WA Broome Prawn Managed fisheries activity in the vicinity of the Operational Area

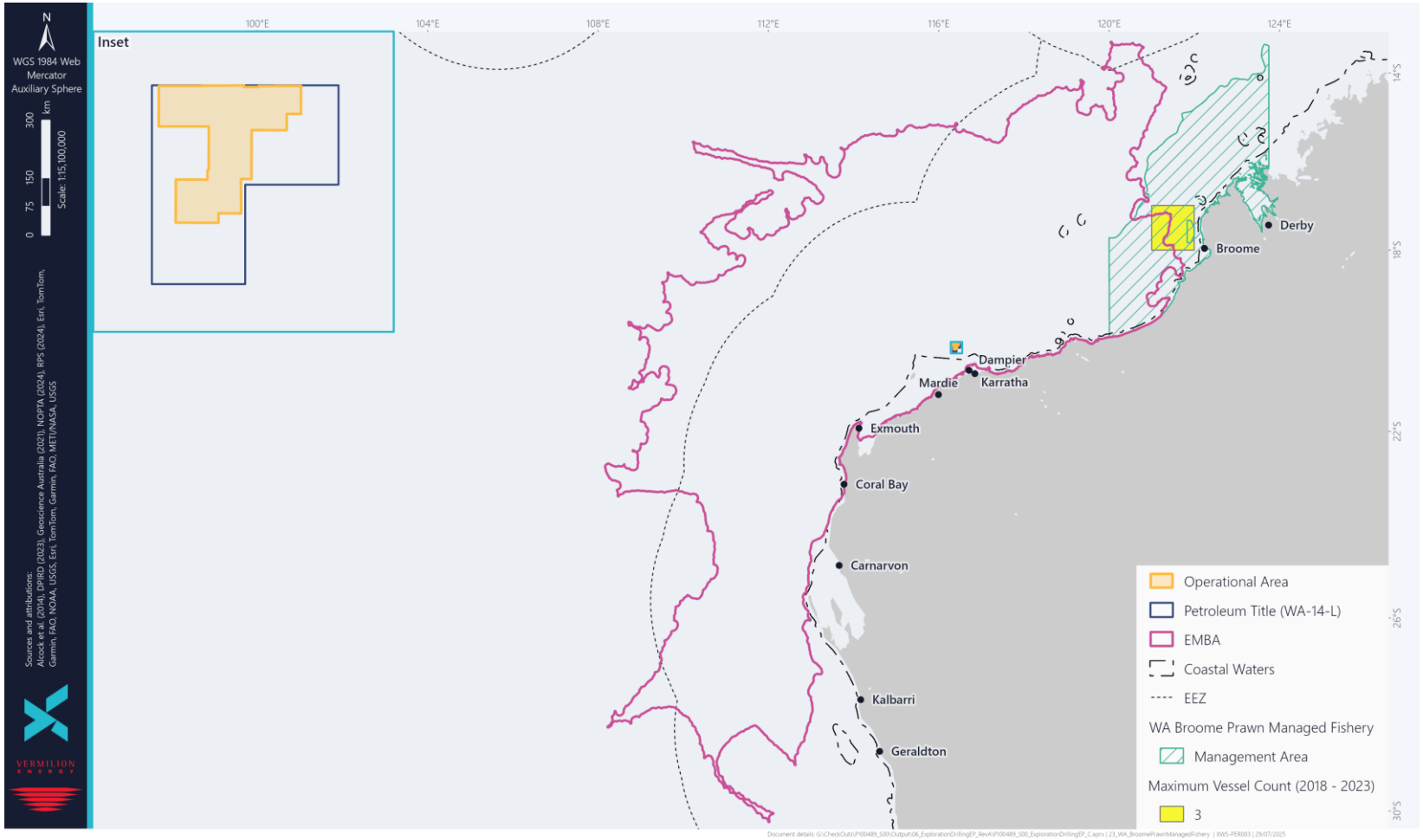


Figure 3-16: WA Exmouth Gulf Beach Seine and Mesh Net Managed fisheries activity in the vicinity of the Operational Area

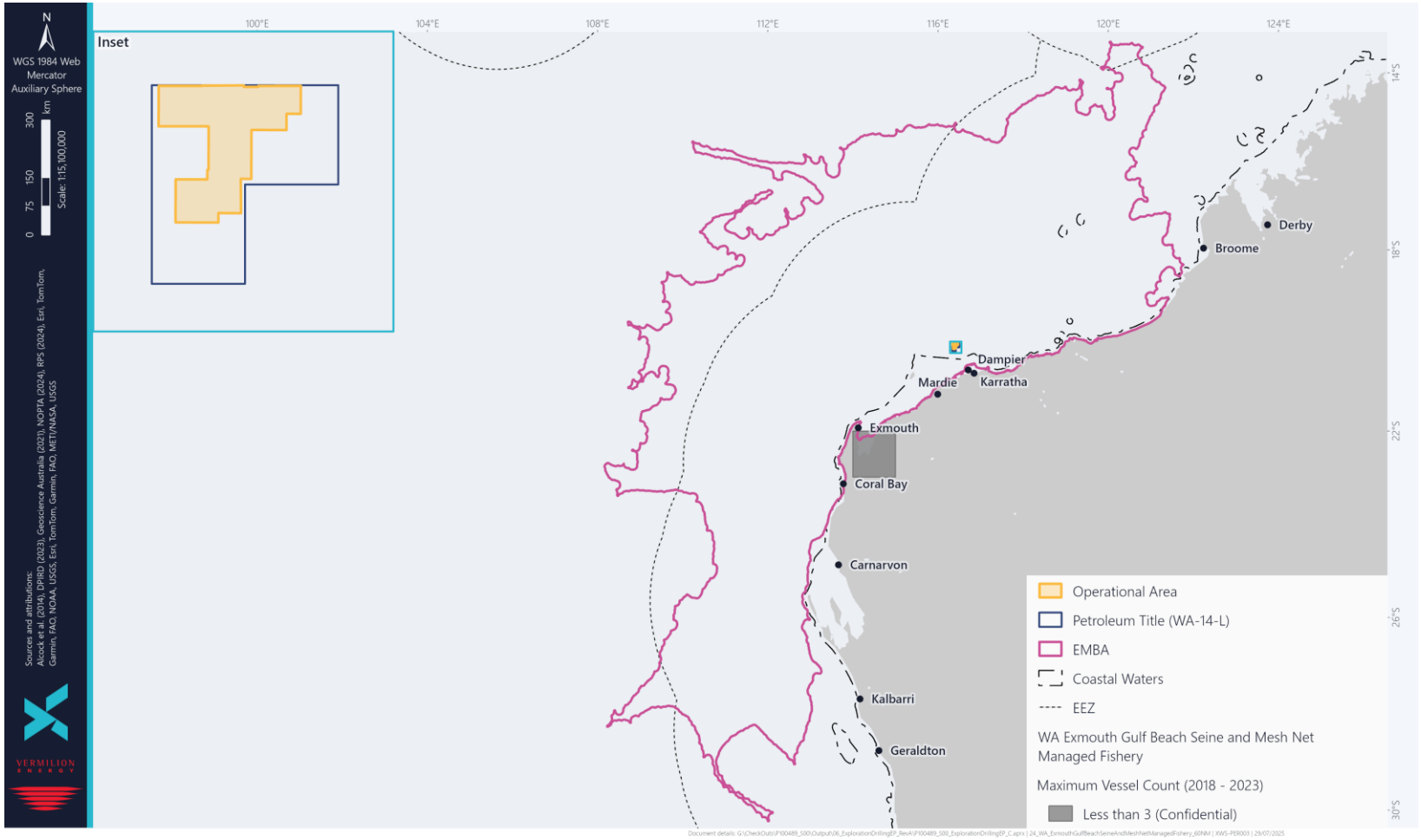


Figure 3-17: Exmouth Gulf Prawn Managed fisheries activity in the vicinity of the Operational Area

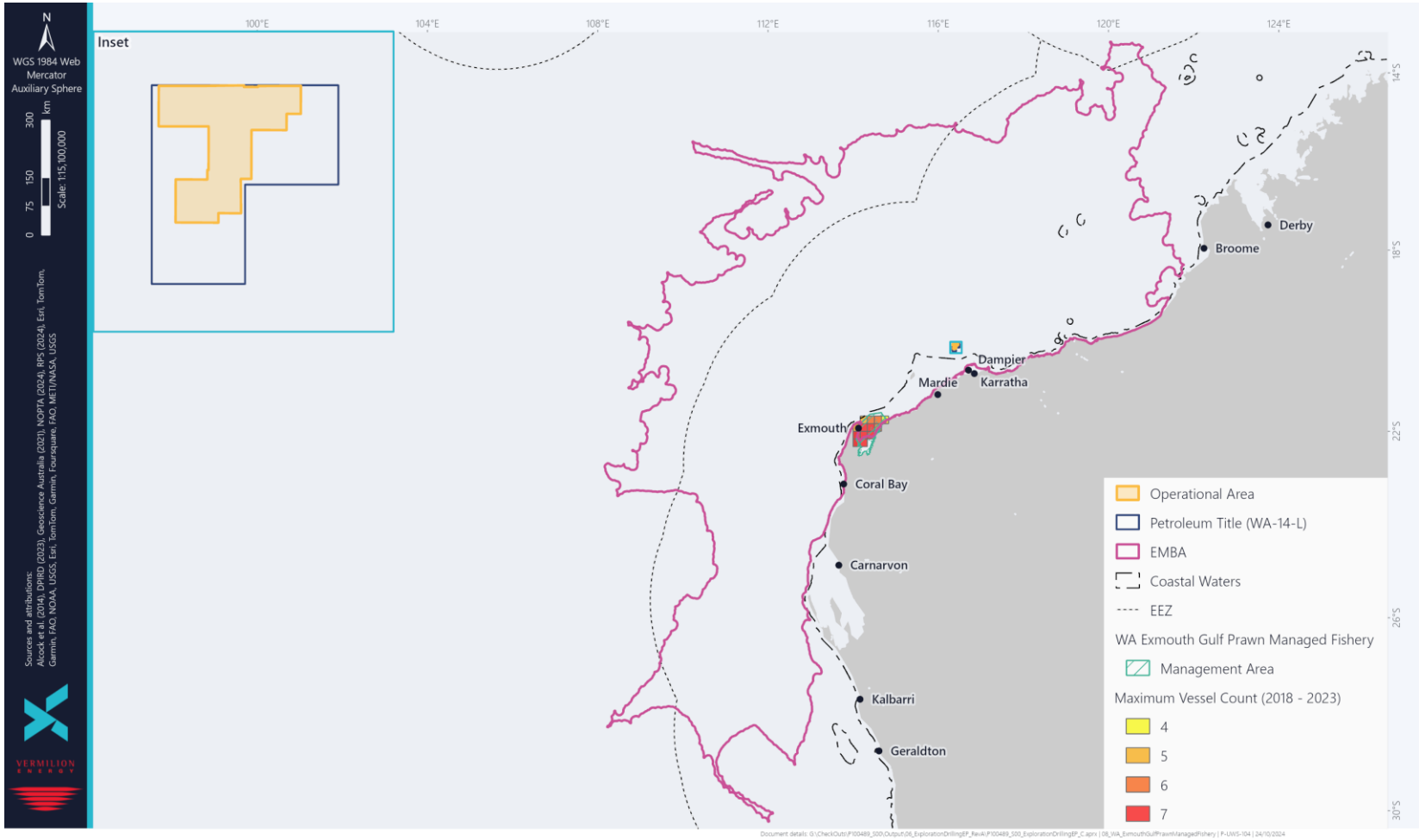


Figure 3-18: FBL Condition 74 Fish Trapping fisheries activity in the vicinity of the Operational Area

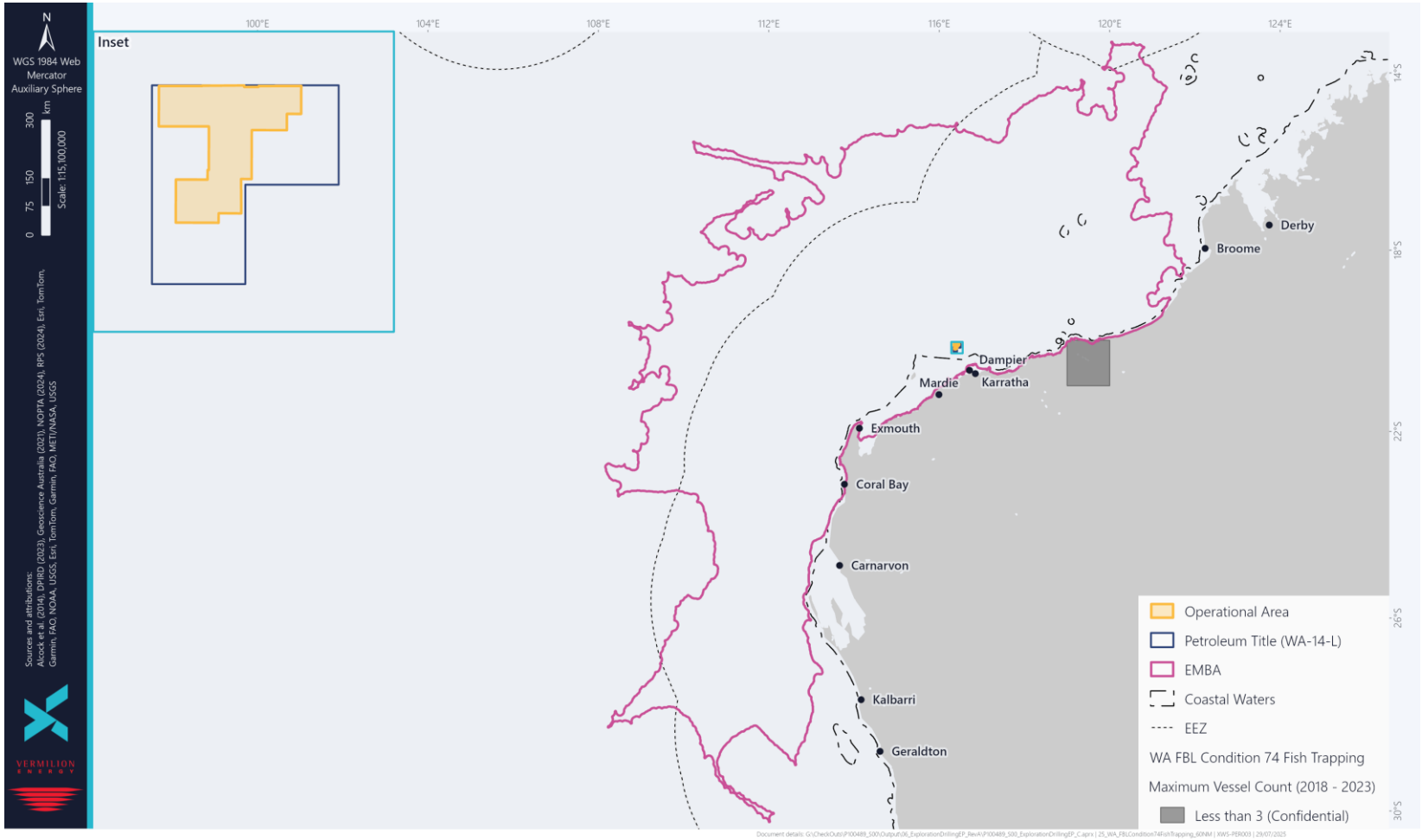


Figure 3-19: West Coast Demersal Scalefish (Interim) Managed fisheries activity in the vicinity of the Operational Area

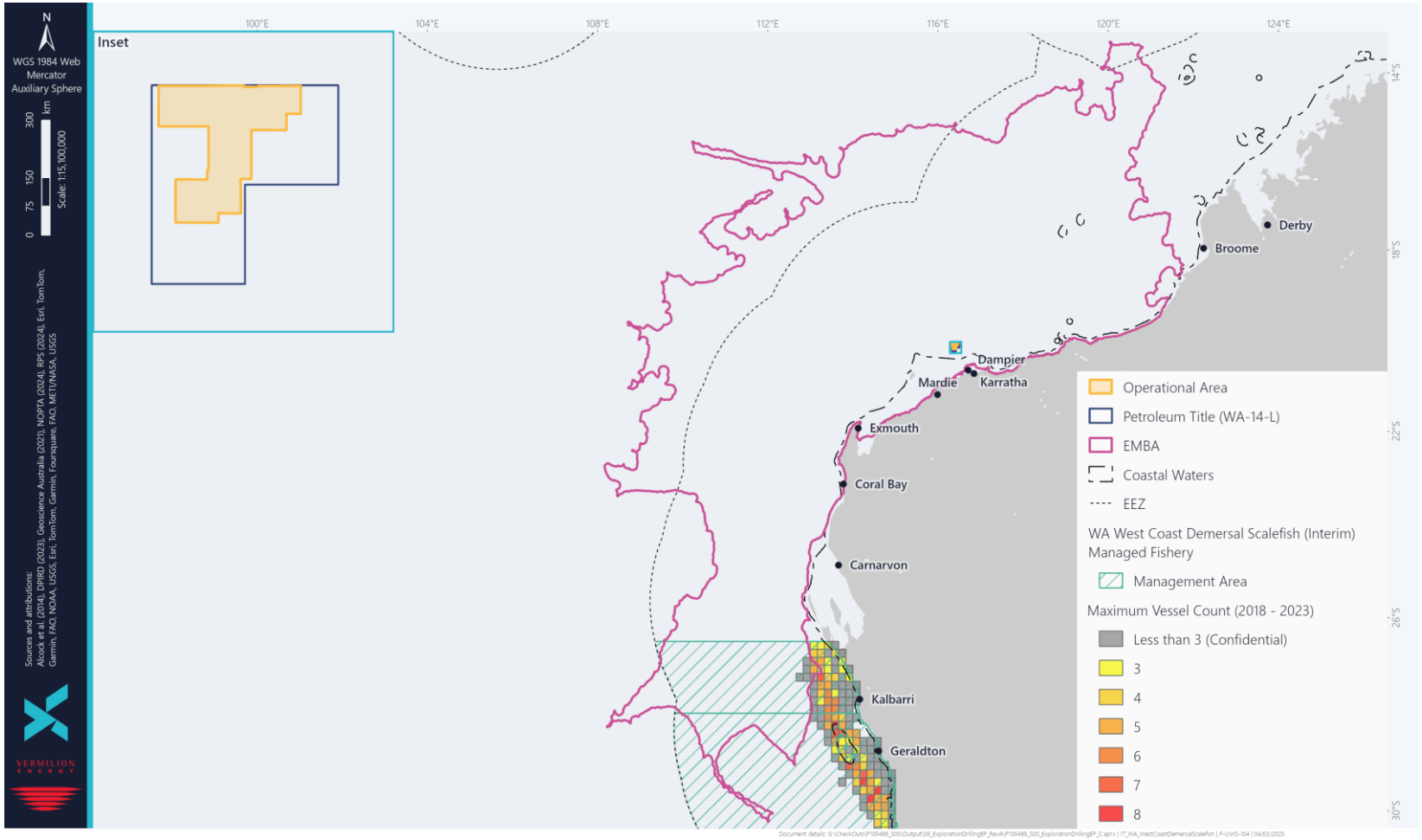


Figure 3-20: West Coast Deep Sea Crustacean Managed fisheries activity in the vicinity of the Operational Area

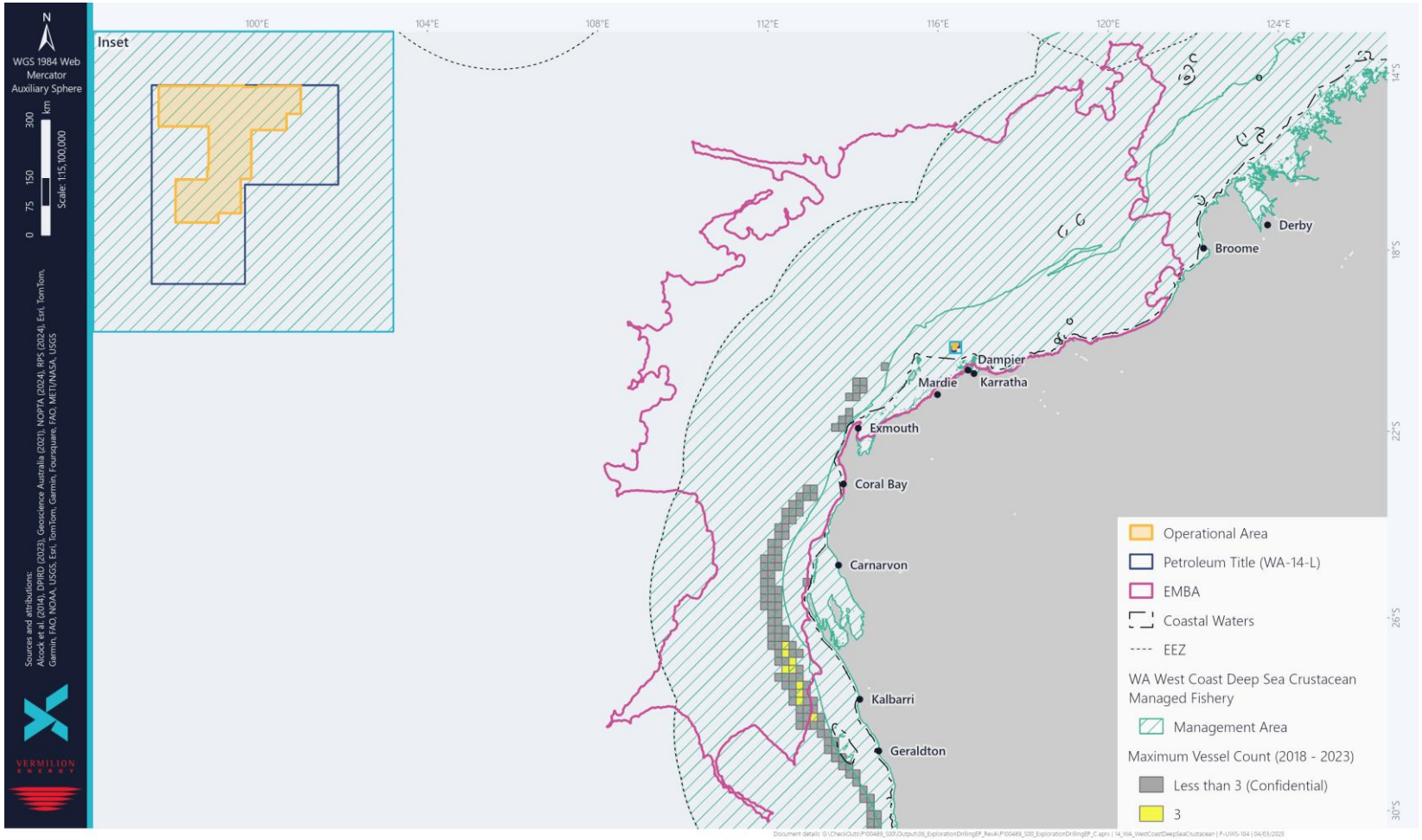


Figure 3-21: WA Gascoyne Demersal Scalefish managed fisheries activity in the vicinity of the Operational Area

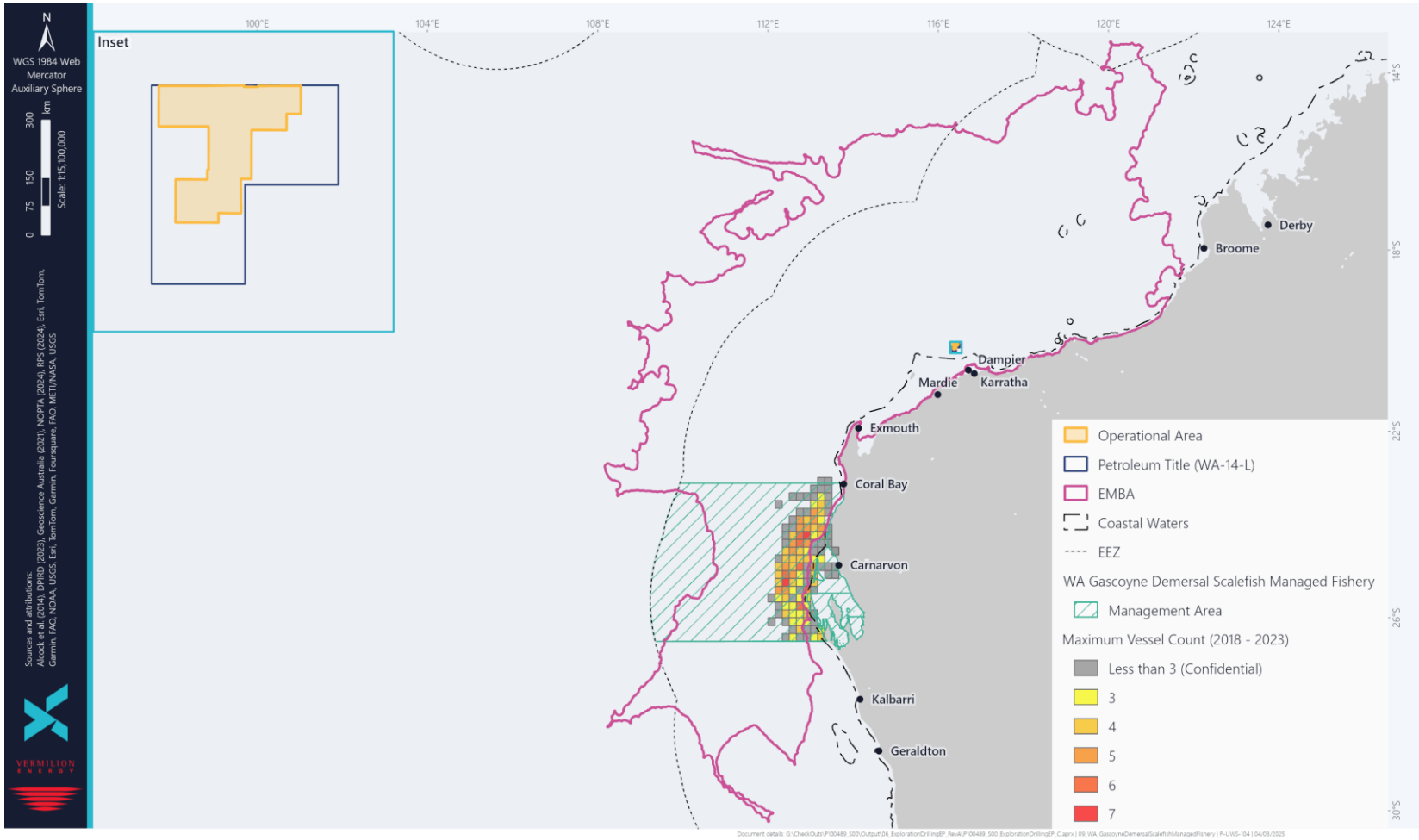


Figure 3-22: WA marine aquarium managed fisheries activity in the vicinity of the Operational Area

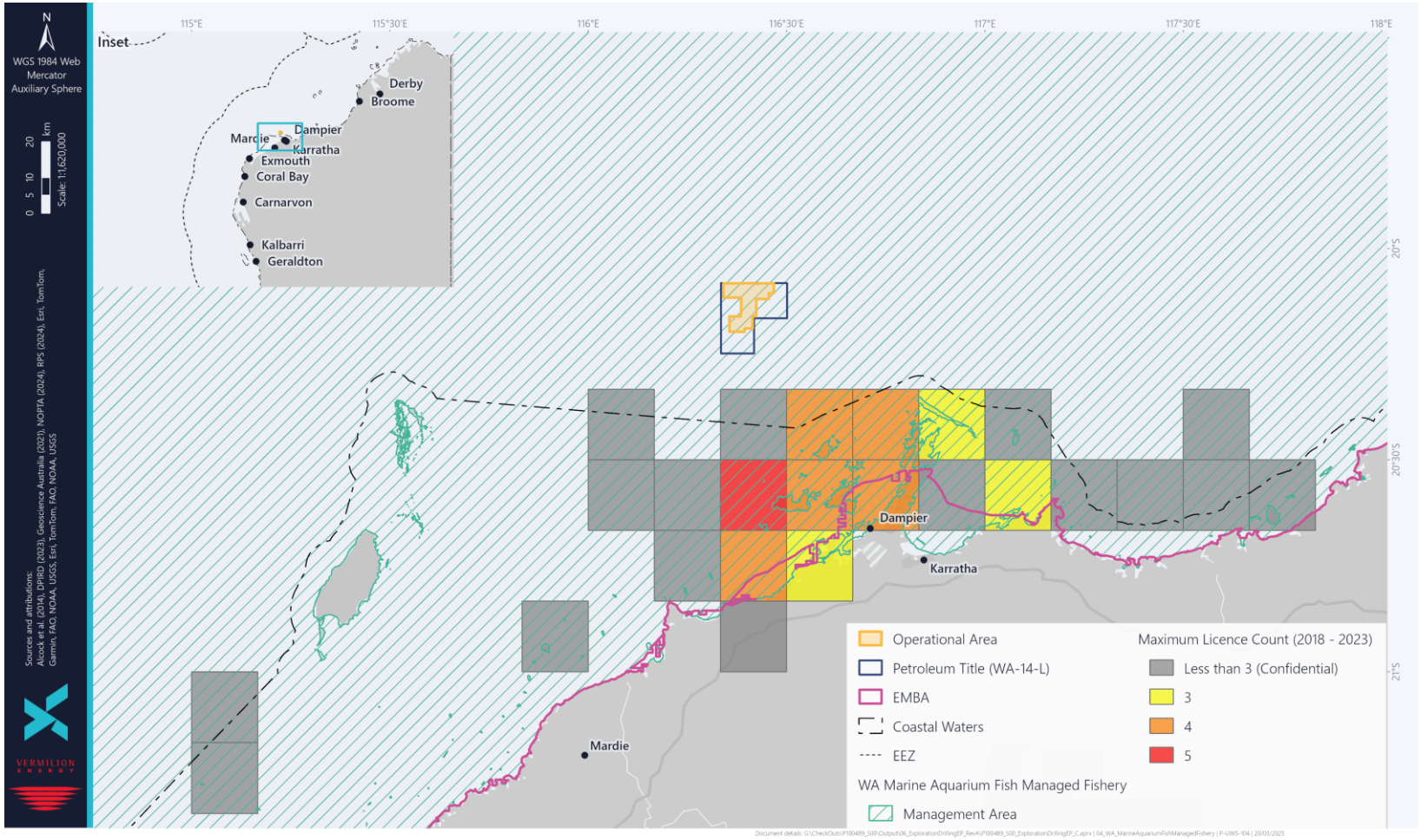


Figure 3-23: WA Open Access fisheries activity in the vicinity of the Operational Area

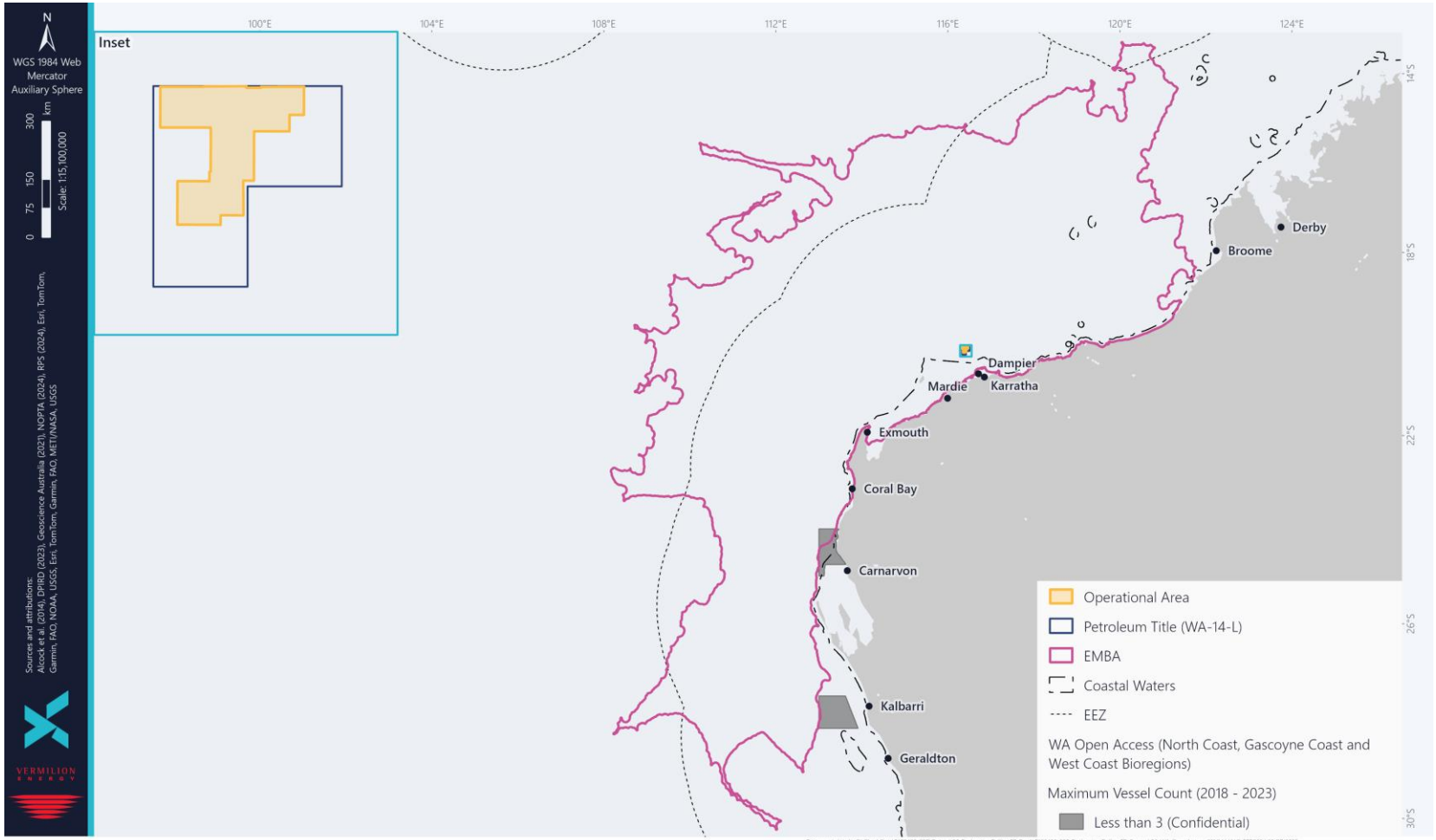


Figure 3-24: WA Pearl Oyster Managed fisheries activity in the vicinity of the Operational Area

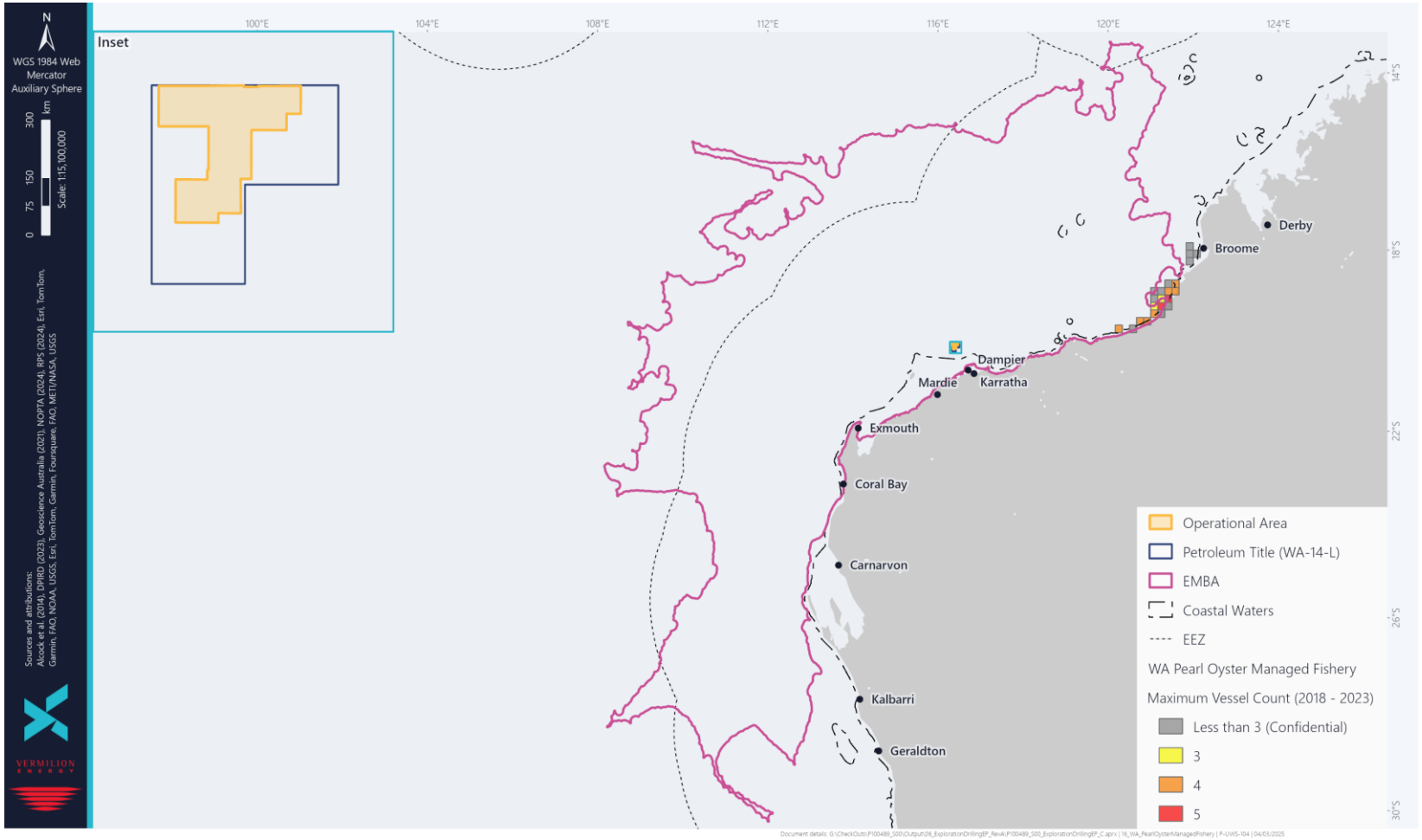


Figure 3-25: WA Northern Demersal Scalefish Managed fisheries activity in the vicinity of the Operational Area

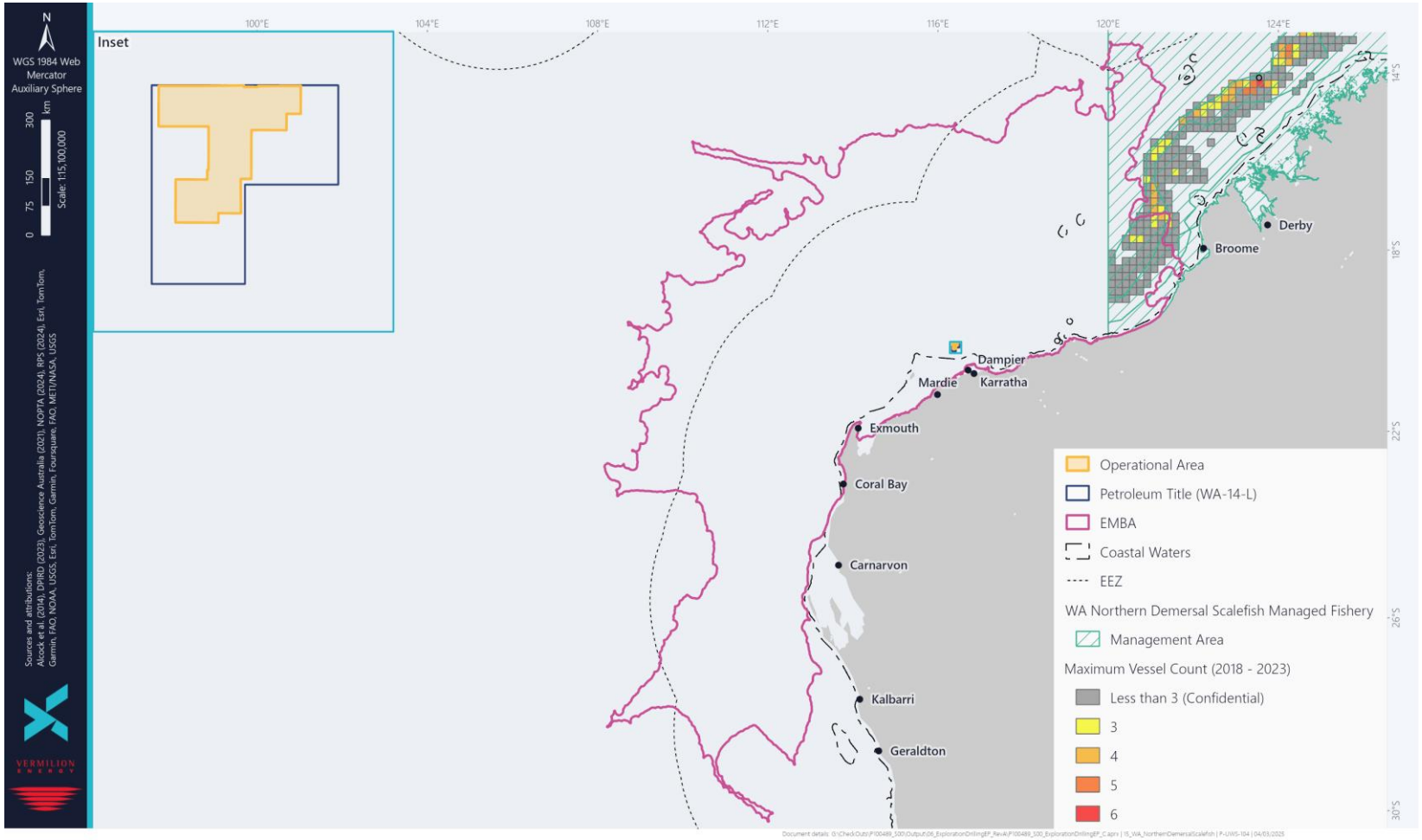


Figure 3-26: WA Pilbara Crab Managed fisheries activity in the vicinity of the Operational Area

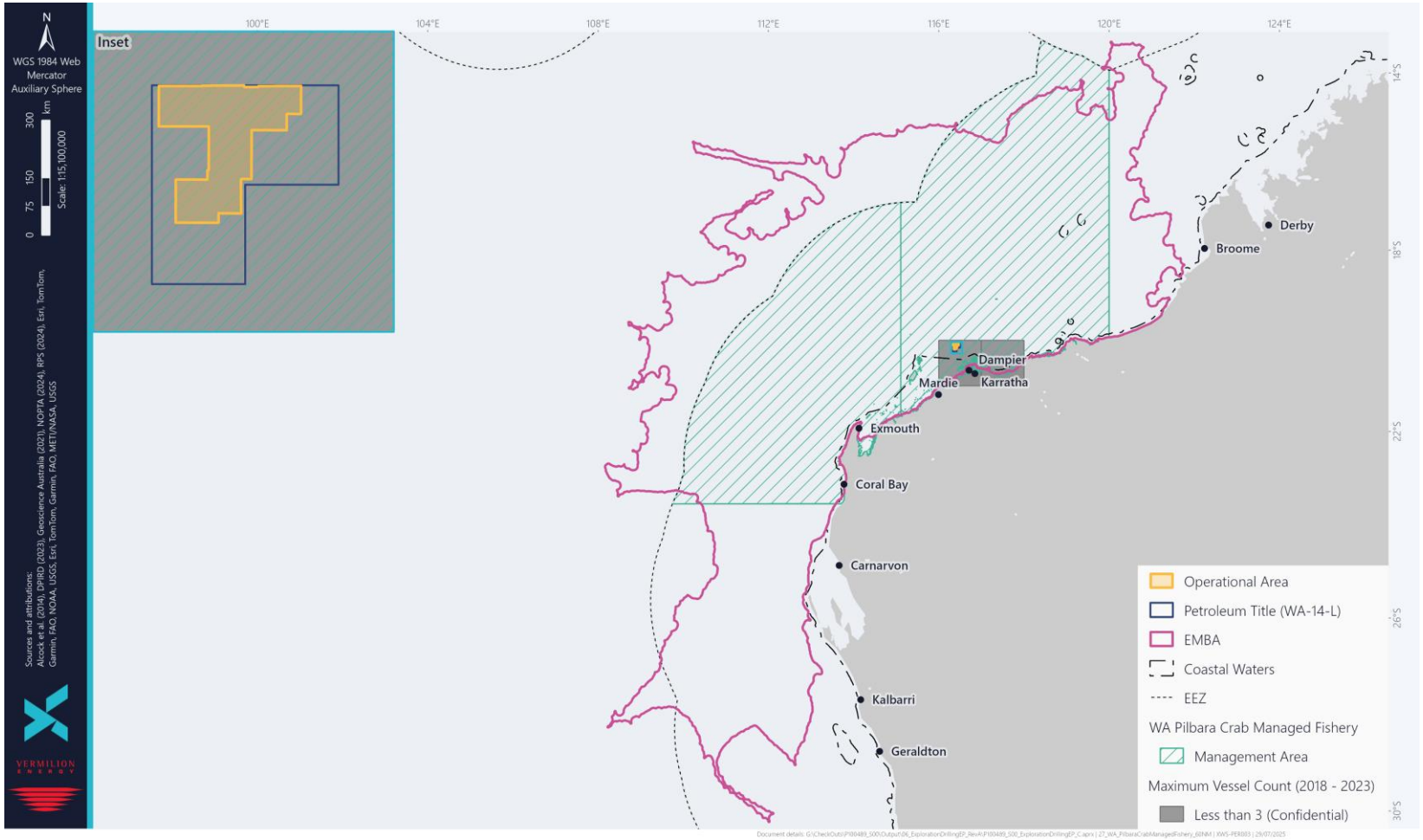


Figure 3-27: WA Onslow prawn, specimen shell, mackerel and Nickol Bay prawn fisheries activity in the vicinity of the Operational Area

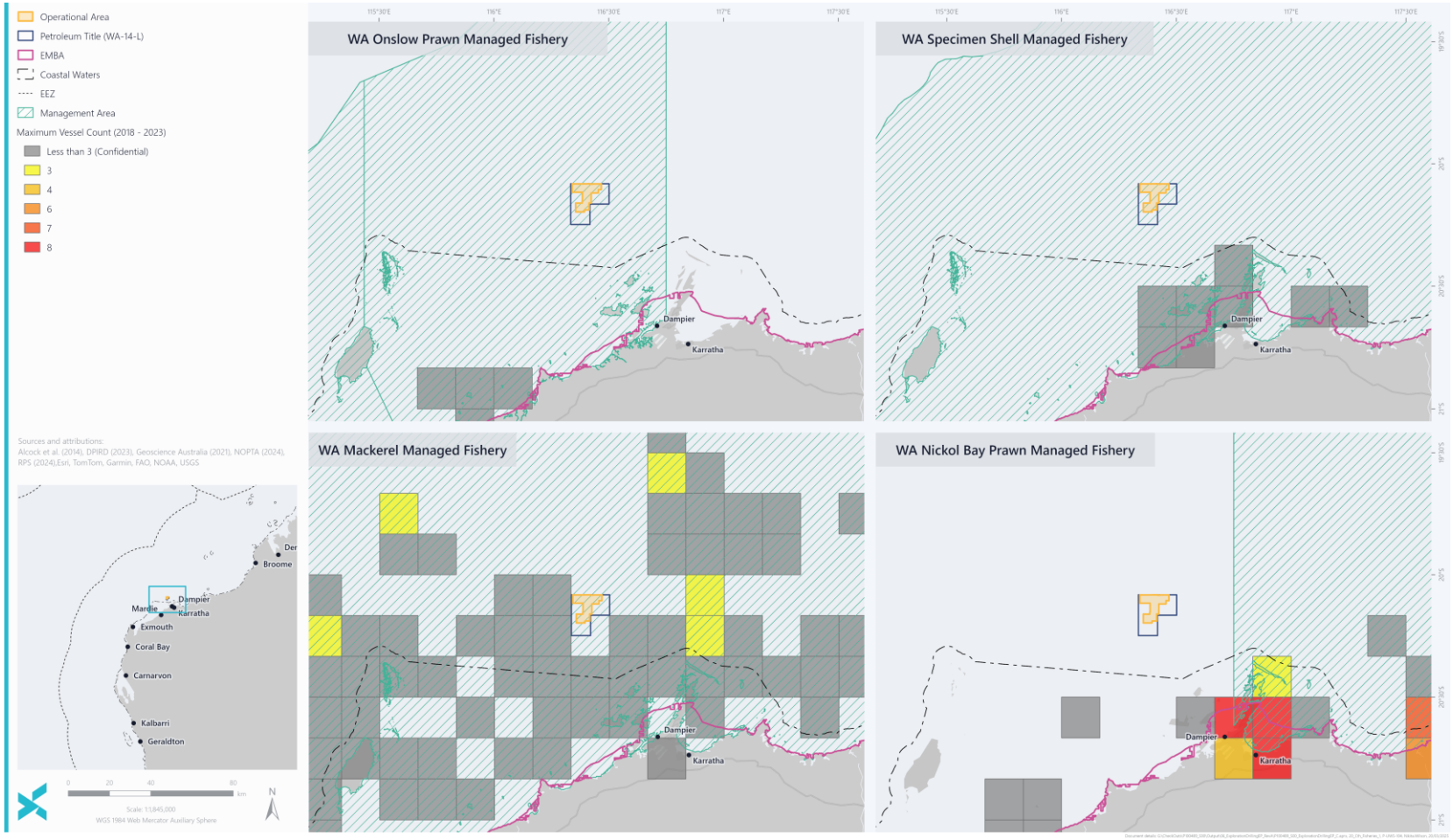


Figure 3-28: WA Pilbara fish trawl and sea cucumber fisheries activity in the vicinity of the Operational Area

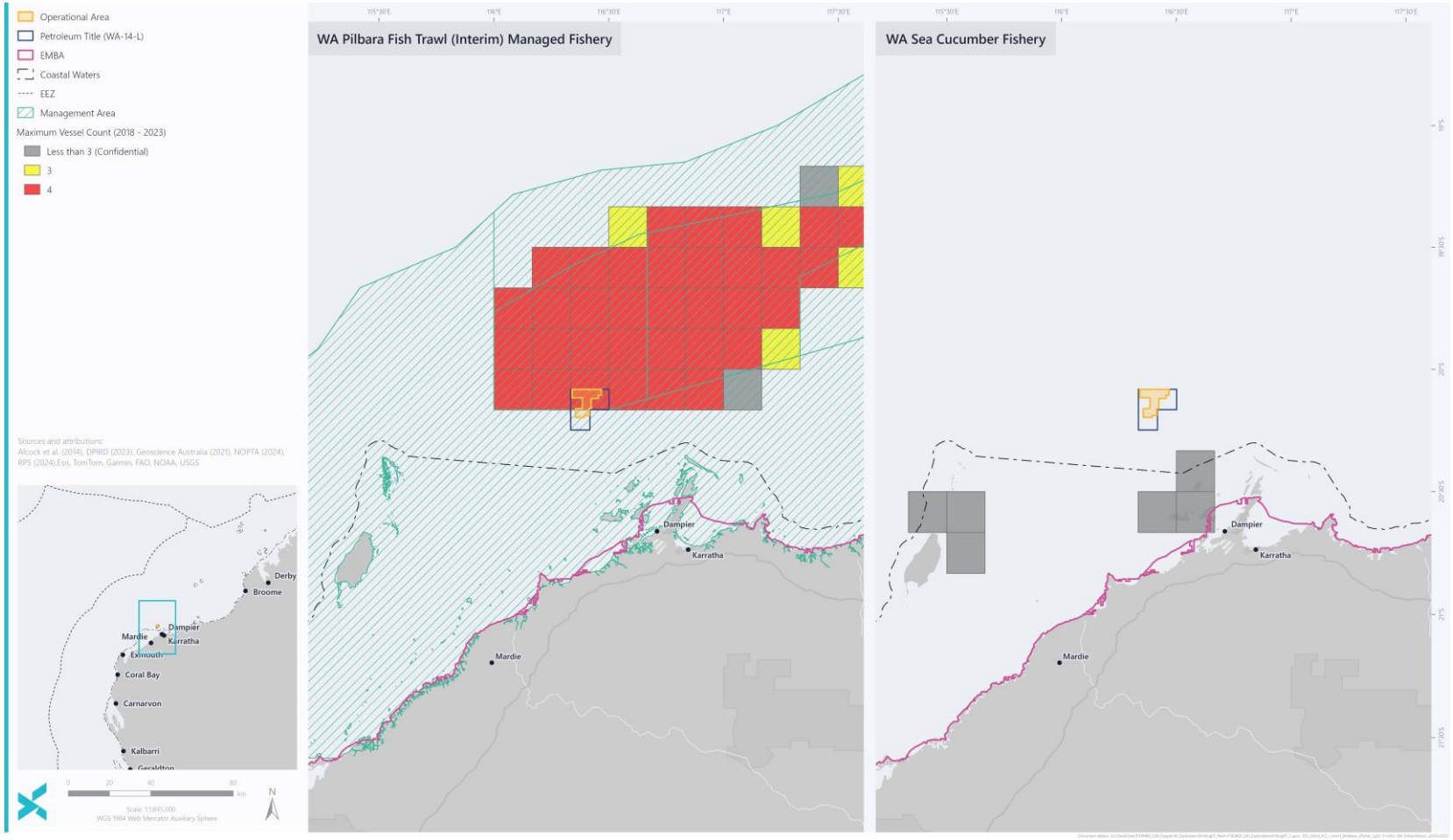


Figure 3-29: WA Pilbara Line Fishery (condition) fisheries activity within the vicinity of the Operational Area

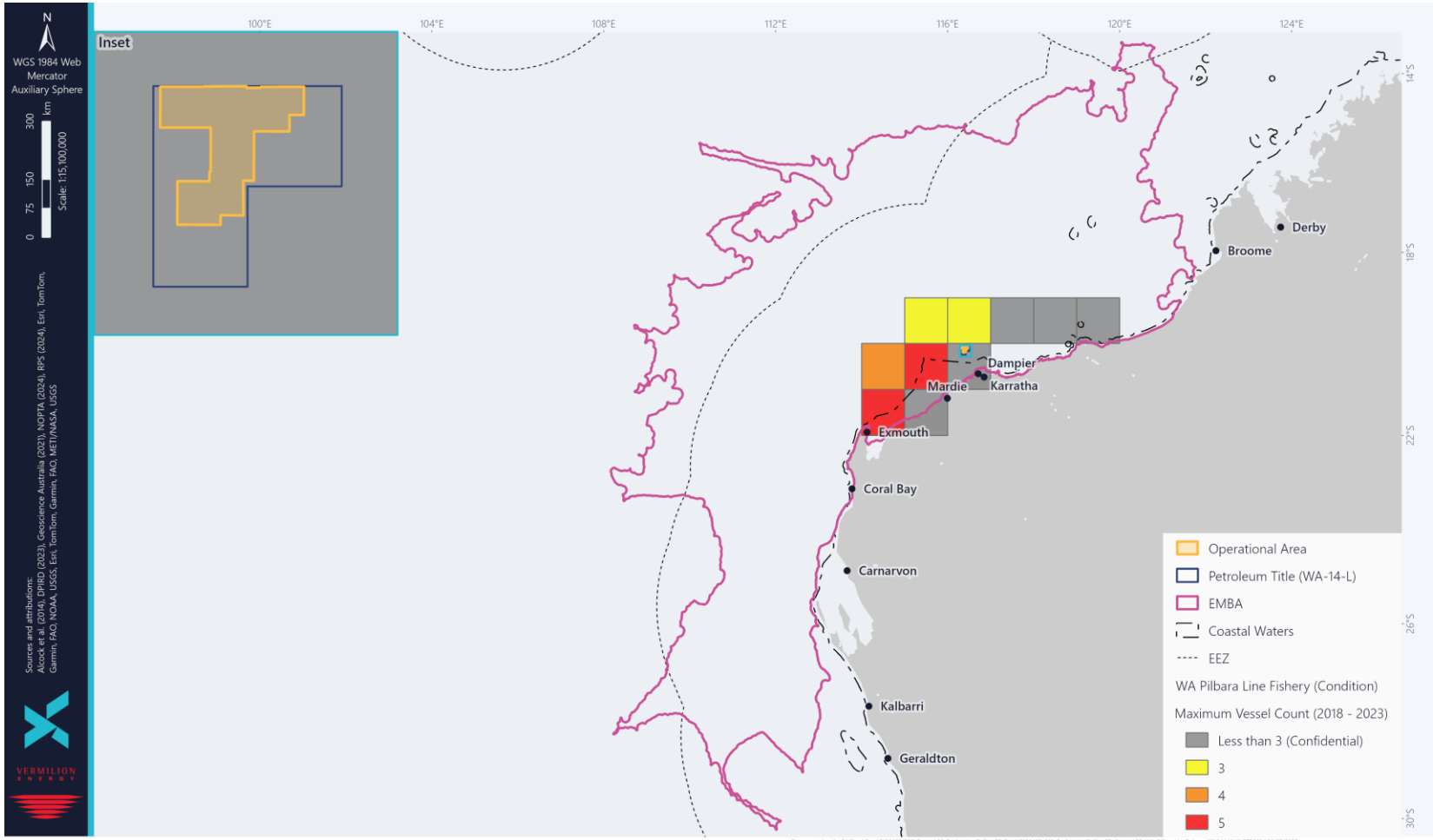


Figure 3-30: WA Pilbara Trap Managed fisheries activity within the vicinity of the Operational Area

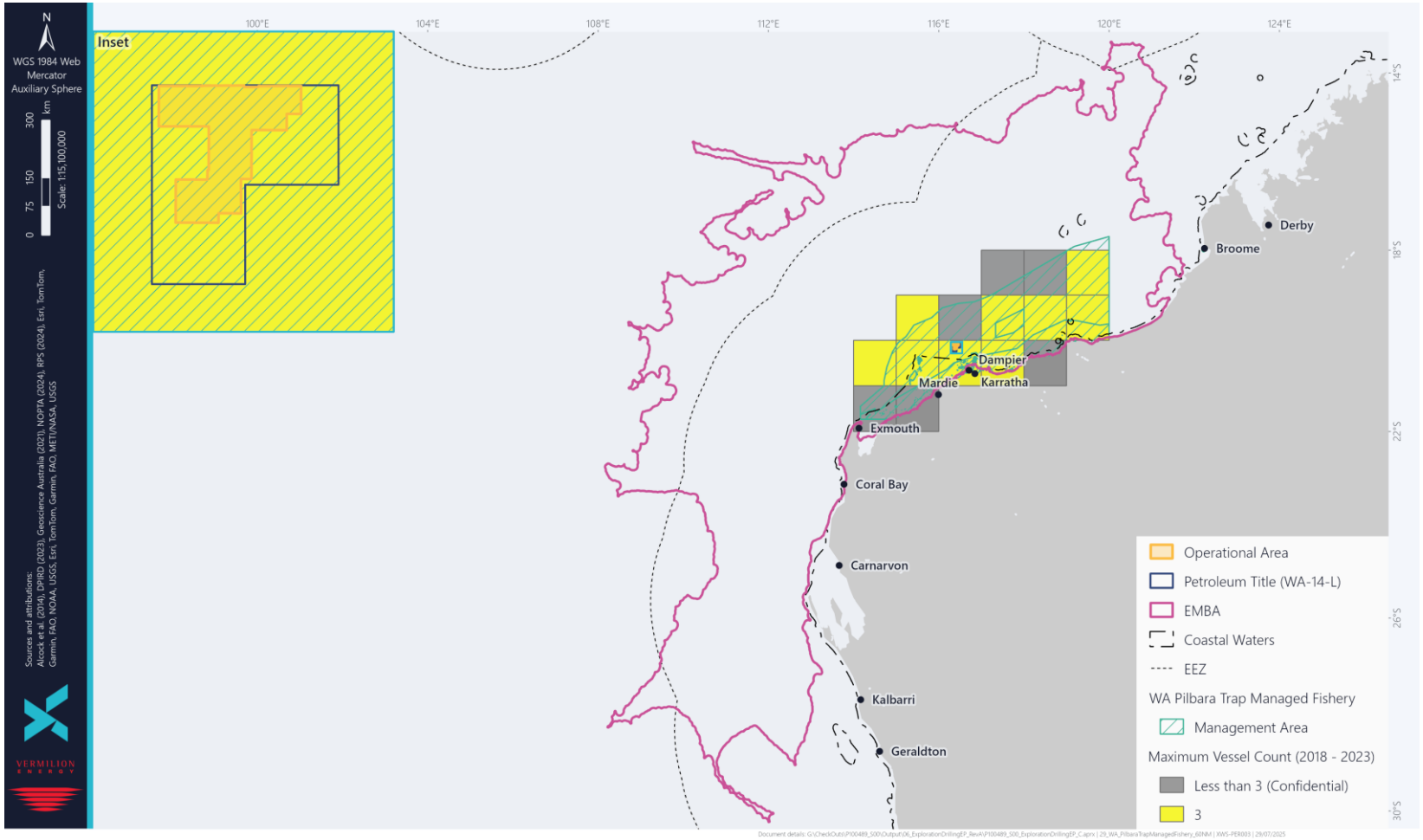


Figure 3-31: West Coast Rock Lobster Managed Fishery fisheries activity in the vicinity of the Operational Area

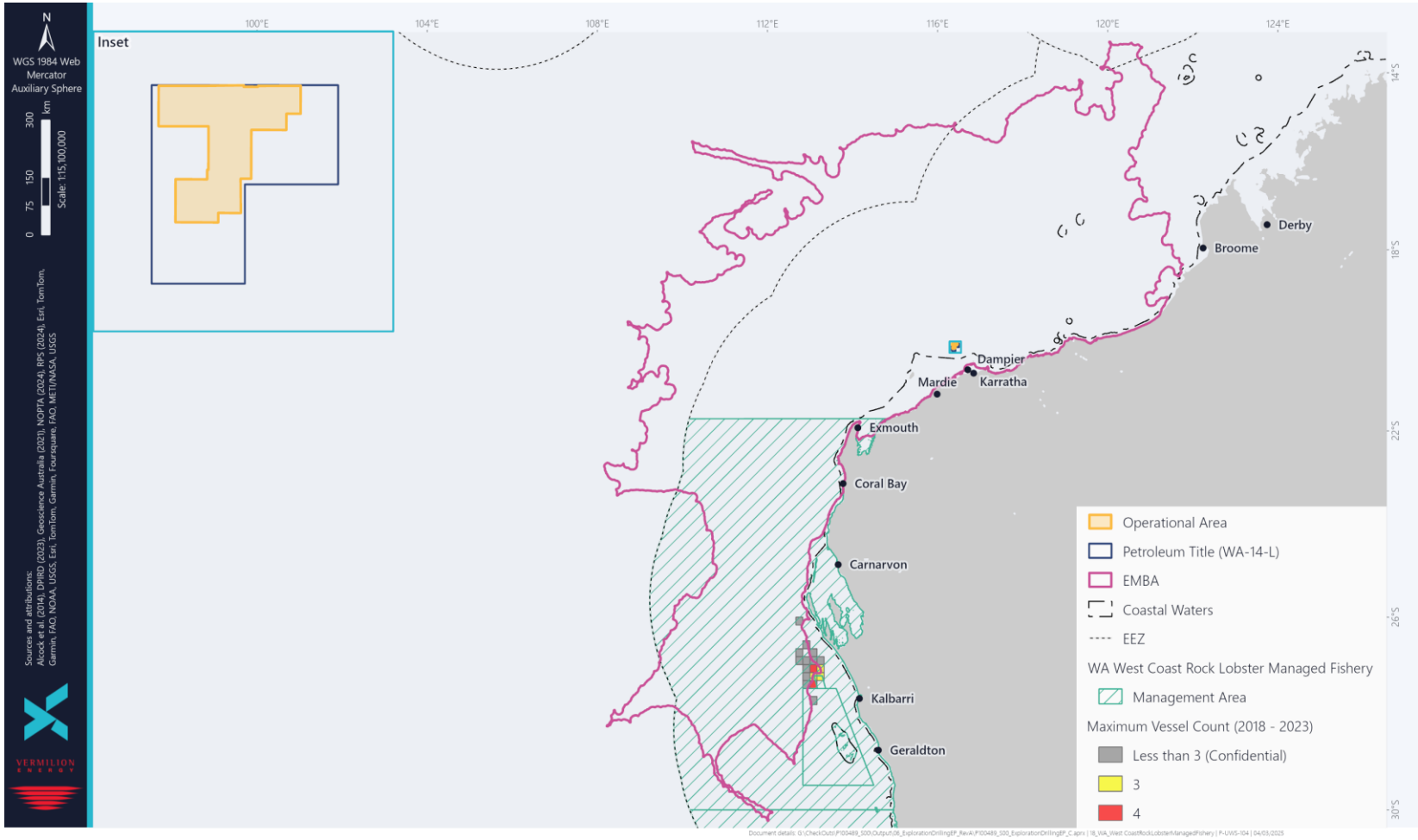


Figure 3-32: WA Shark Bay Crab Managed fisheries activity within the vicinity of the Operational Area

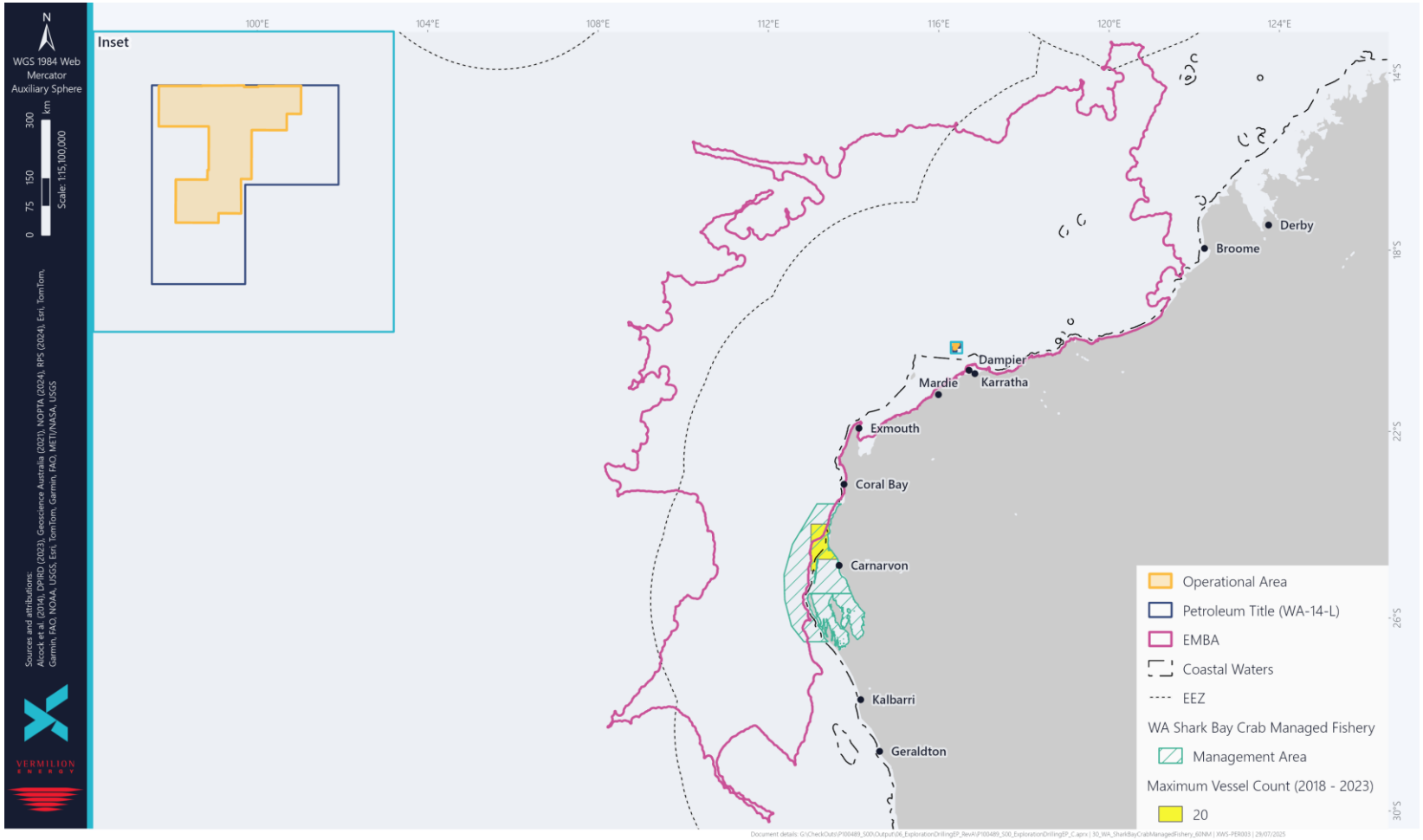


Figure 3-33: WA Shark Bay Prawn Managed fisheries activity within the vicinity of the Operational Area

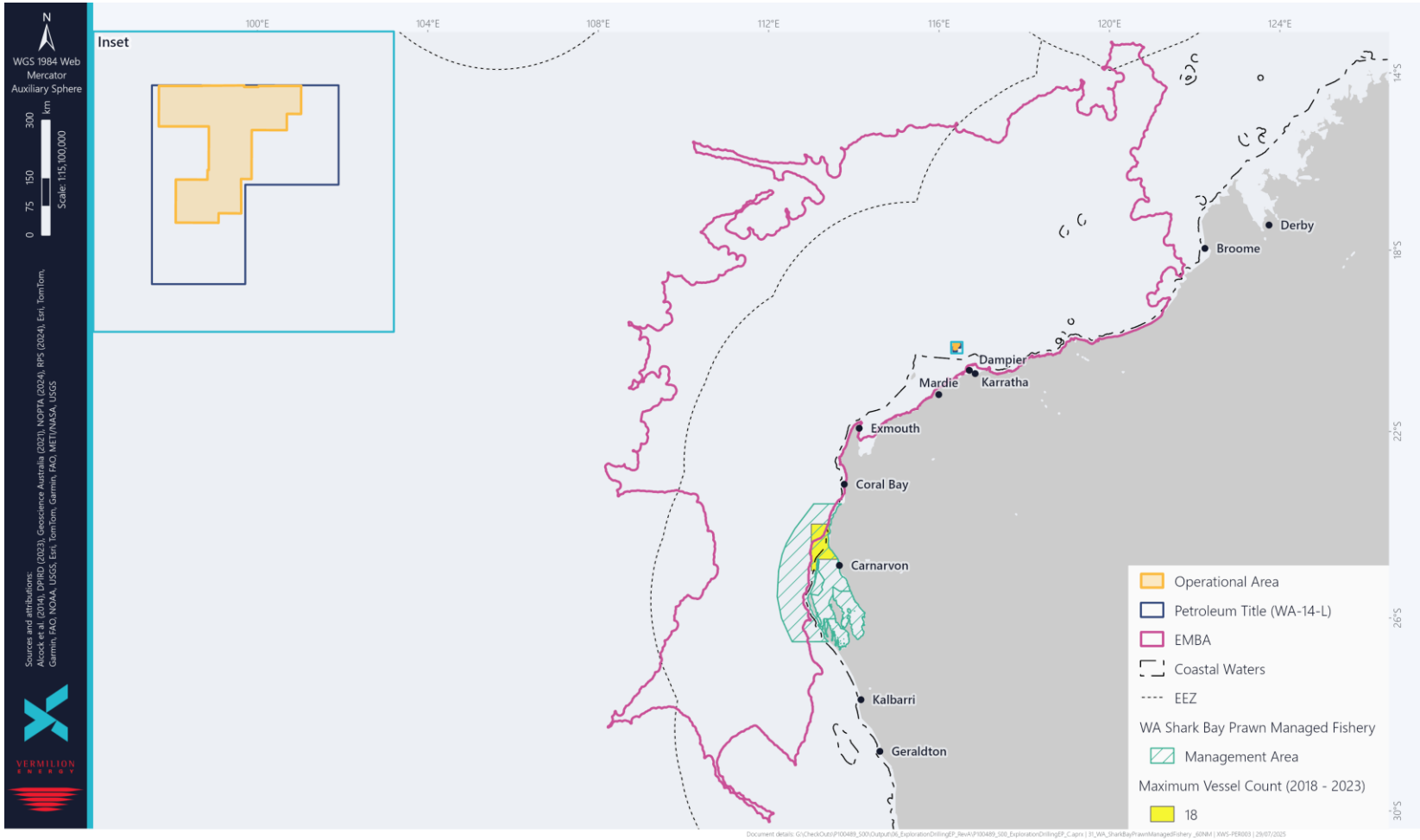


Figure 3-34: WA Shark Bay Scallop Managed fisheries activity within the vicinity of the Operational Area

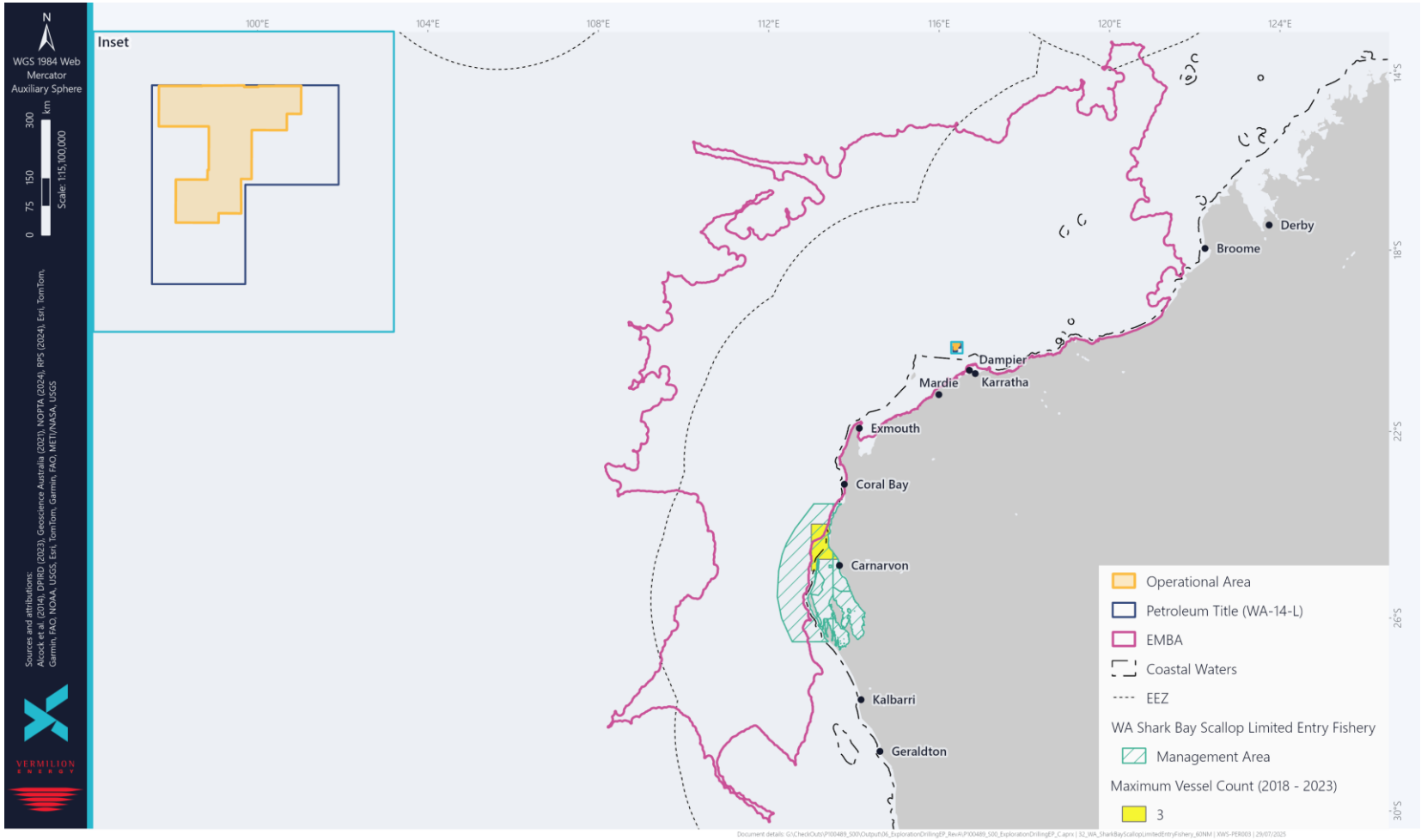
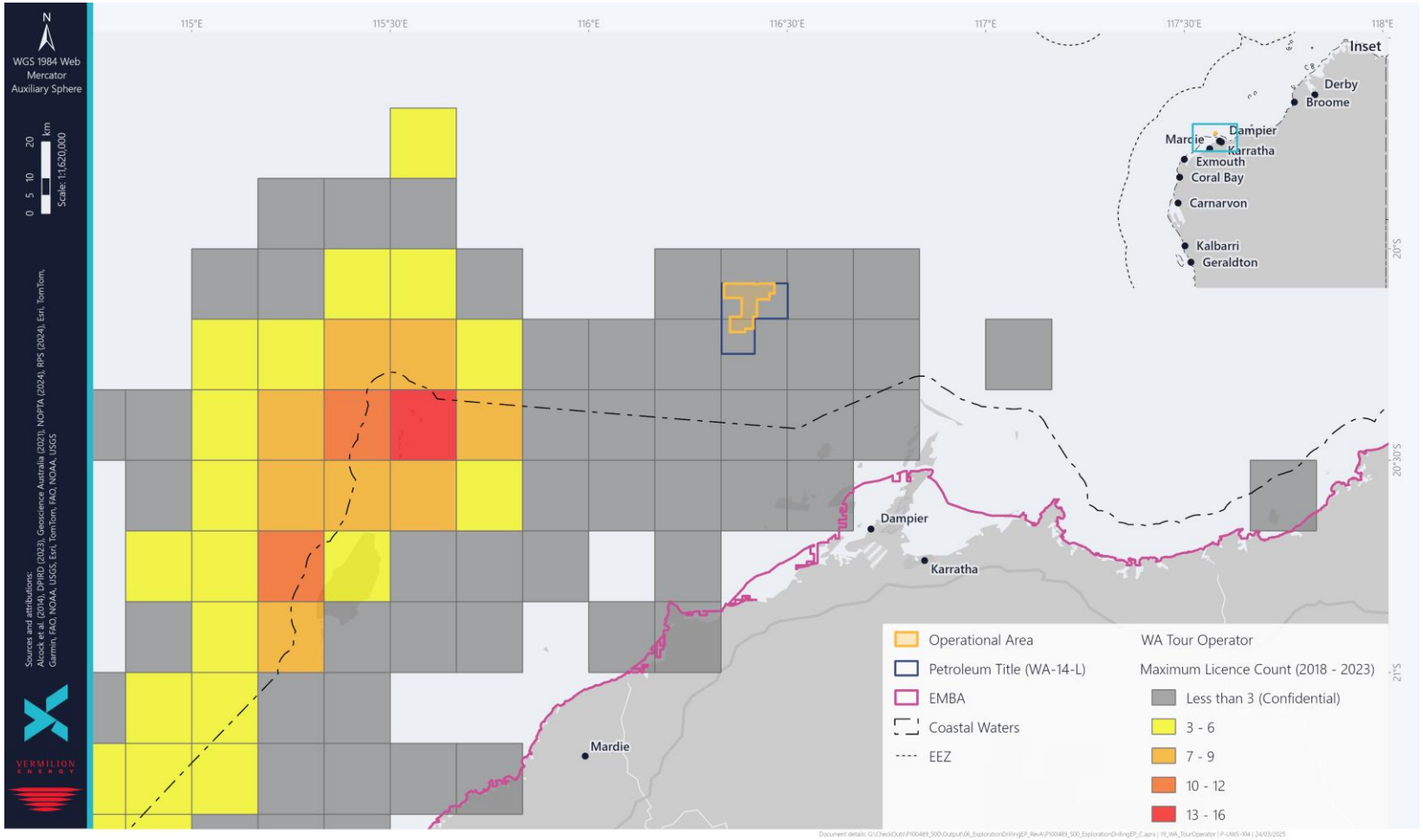


Figure 3-35: WA tour operator activity within the vicinity of the Operational Area



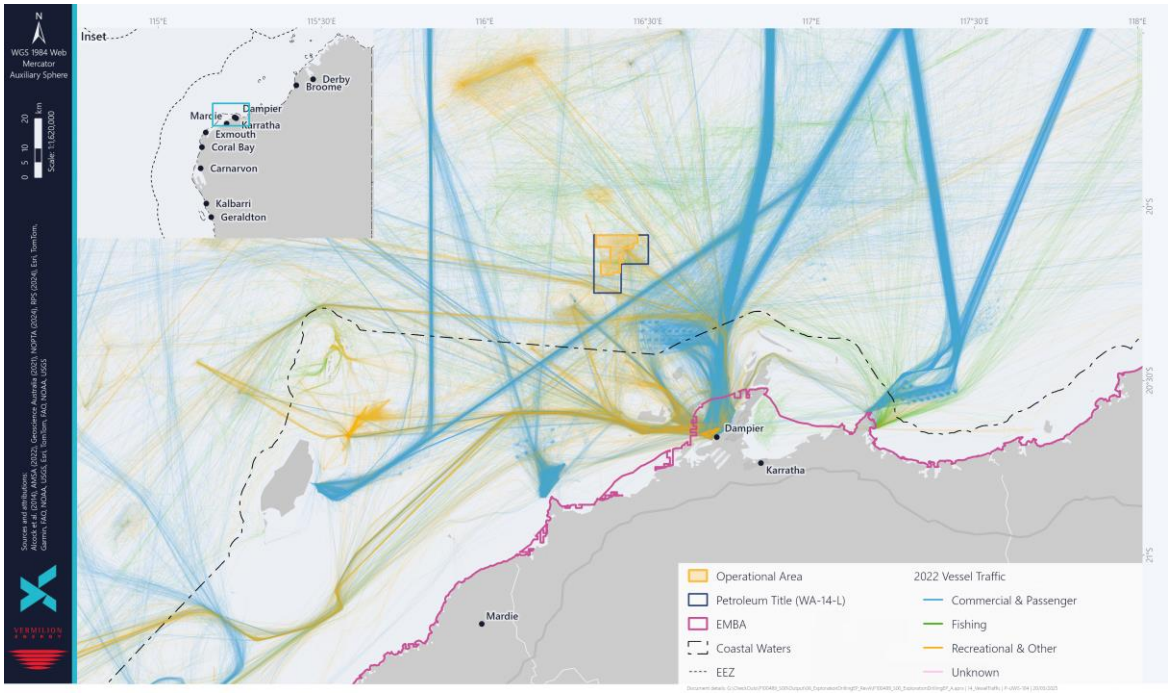
3.5.2 Commercial Shipping

Significant commercial shipping activity occurs within the EMBA, the majority of which is associated with the WA oil and gas and mining industries.

AMSA has established a network of shipping fairways for the NWS with the aim to reduce the risk of collision between transiting vessels and offshore infrastructure (AMSA, 2012). The fairways are intended to direct large vessels such as bulk carriers and Liquefied Natural Gas (LNG) ships trading to the major ports into pre-defined routes to keep them clear of existing and planned offshore infrastructure.

The closest AMSA shipping fairway is ~3 km south of the Operational Area (Figure 3-36).

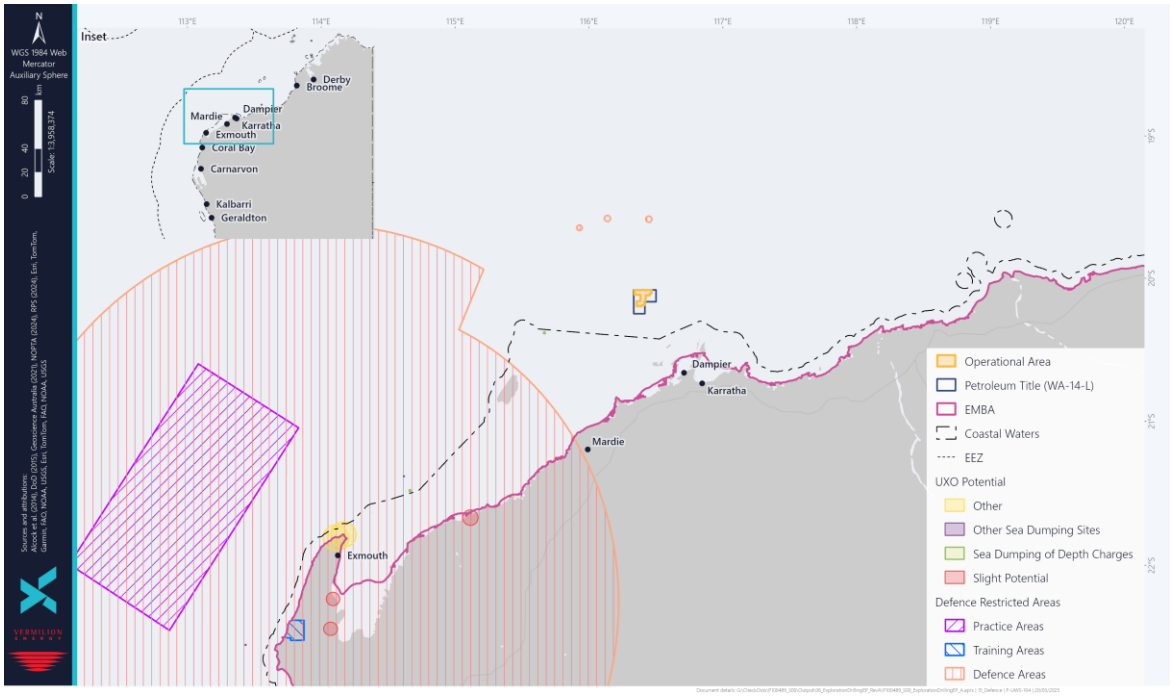
Figure 3-36: Vessel traffic within the EMBA



3.5.3 Defence

There are no Defence related uses within the Operational Area (Figure 3-37). The EMBA encompasses the military installations near Exmouth, including a naval communication station. The Department of Defence has several offshore training areas including the North West Cape which is around 57 km north of the Operational Area at its closest. The EMBA also overlaps the North West Exercise Area (NWXA) defence area, and Learmonth Air Weapons Range practice and training areas. These areas are used for Defence Force training exercises, including live firing. No unexploded ordnance (UXO) potential has been identified within the Operational Area.

Figure 3-37: Defence areas within the EMBA



3.5.4 Other Users

3.5.4.1 Tourism

Tourism plays a significant role in the NWS region. Popular water-based tourism activities include:

- Whale watching
- Recreational boating and fishing
- Charter fishing
- Snorkelling/diving
- Surfing.

Popular land-based activities include bushwalking, camping, bird watching and four-wheel driving.

Recreational fishing is an integral part of the Pilbara lifestyle. The region's unique coastline includes some of Australia's prime fishing locations and an array of offshore islands, coral reef systems and offshore habitats. These experiences make recreational fishing a key driver of visitation to the region, attracting visitors from around the state and country. The region has the highest per capita boat ownership in Australia, and recreational fishing contributes approximately $190 m to the WA economy annually. This expenditure includes accommodation, boat fuel, bait and ice, food and drinks and land travel (McLeod and Linder, 2018).

Recreational fishing has increased offshore in recent years, as the area is accessed for deepwater fishing by the charter sector and fishers in larger boats. The DPIRD recreational fishing location guide (DPIRD, 2023a) names the Wandoo platform as a fishing location.

The Ningaloo Coast tourism precinct occurs within the EMBA. In 2018-19, the Ningaloo region (Ningaloo Reef and the surrounding coastal region Exmouth Gulf, communities of Exmouth and Coral Bay, and adjacent proposed southern coastal reserves and pastoral leases) contributed an estimated $110 million in value added to the WA economy (DBCA, 2020b). Ningaloo's economic contribution to WA is attributed to 4 key types of economic activity, tourism expenditure by international, interstate and WA visitors to the Ningaloo region, commercial fishing in the Exmouth Gulf, recreation activity involving the Reef by residents of the Ningaloo region and management and research relating to the Reef (DBCA, 2020b). More than 90% of this value added is attributed to the domestic and international tourists who visit Ningaloo each year (DBCA, 2020b).

3.5.4.2 Offshore Oil and Gas Industry

The petroleum exploration and production industry is a significant stakeholder in the region. Petroleum companies have been undertaking exploration and production activities on the NWS for a number of years.

Petroleum infrastructure within the Operational Area includes the Wandoo B platform and Wandoo A unmanned monopod. Petroleum infrastructure within the vicinity of the Operational Area includes the Reindeer platform (~7 km northwest), and the Stag platform (~13 km southwest). There are also several submerged pipelines associated with petroleum fields and facilities with onshore processing hubs. Nearby pipelines include the TL1 and TL2 export pipelines from the North Rankin Complex to the Karratha Gas Plant (<1 km from the Operational Area), Devil Creek Pipeline (~3 km from the Operational Area), Pluto LNG gas export pipeline, and the Scarborough export trunkline (~3 km from the Operational Area). Table 3-9 identifies other oil and gas facilities that overlap with the Operational Area, Hydrocarbon Area and the EMBA.

Table 3-9: Offshore oil and gas facilities overlapping the Project Areas

Offshore oil and gas facilities	Project Areas			Distance from Operational Area (km)
	Operational Area	Hydrocarbon Area	EMBA	
Angel (Woodside Energy Ltd)	-	-	✓	65 km north-east
Double Island (Santos)	-	-	✓	108 km south-west
Gibson (Santos)	-	-	✓	99 km south-west
Goodwyn Alpha (Woodside Energy Ltd)	-	-	✓	64 km north-west
Gorgon (Chevron)	-	-	✓	157 km south-west
Harriet A (Santos)	-	-	✓	89 km south-west
Harriet B (Santos)	-	-	✓	85 km south-west
Harriet C (Santos)	-	-	✓	87 km south-west
John Brookes (Santos)	-	-	✓	131 km south-west
Linda (Santos)	-	-	✓	78 km south-west
Ngujima-Yin (Woodside Energy Ltd)	-	-	✓	274 km south-west
Ningaloo Vision (Santos)	-	-	✓	271 km south-west
North Rankin Complex (Woodside Energy Ltd)	-	-	✓	59 km north-west

Offshore oil and gas facilities	Project Areas			Distance from Operational Area (km)
	Operational Area	Hydrocarbon Area	EMBA	
Pyrenees Venture (Woodside Energy Ltd)	-	-	✓	276 km south-west
Reindeer (Santos)	-	✓	✓	7 km north-west
Simpson A (Santos)	-	-	✓	96 km south-west
Simpson B (Santos)	-	-	✓	96 km south-west
Sinbad (Santos)	-	✓	✓	74 km south-west
Stag (Jadestone Energy)	-	✓	✓	13 km south-west
Varanus Island Marine Export Terminal (Santos)	-	-	✓	91 km south-west
Victoria (Santos)	-	-	✓	101 km south-west
Wandoo A	✓	✓	✓	-
Wandoo B	✓	✓	✓	-
Wheatstone (Chevron)	-	-	✓	97 km west
Wonnich (Santos)	-	-	✓	102 km south-west

3.6 Protected and Significant Areas

Table 3-1 identifies that several protected and significant areas within the Hydrocarbon Area and EMBA are receptors that may be relevant to aspects of the exploration drilling. The descriptions below provide sufficient details to assess all impacts and risks to protected and significant areas.

3.6.1 World Heritage Properties

World Heritage status is awarded by the UNESCO World Heritage Committee to sites that are deemed to possess 'Outstanding Universal Value' – cultural and/or natural significance.

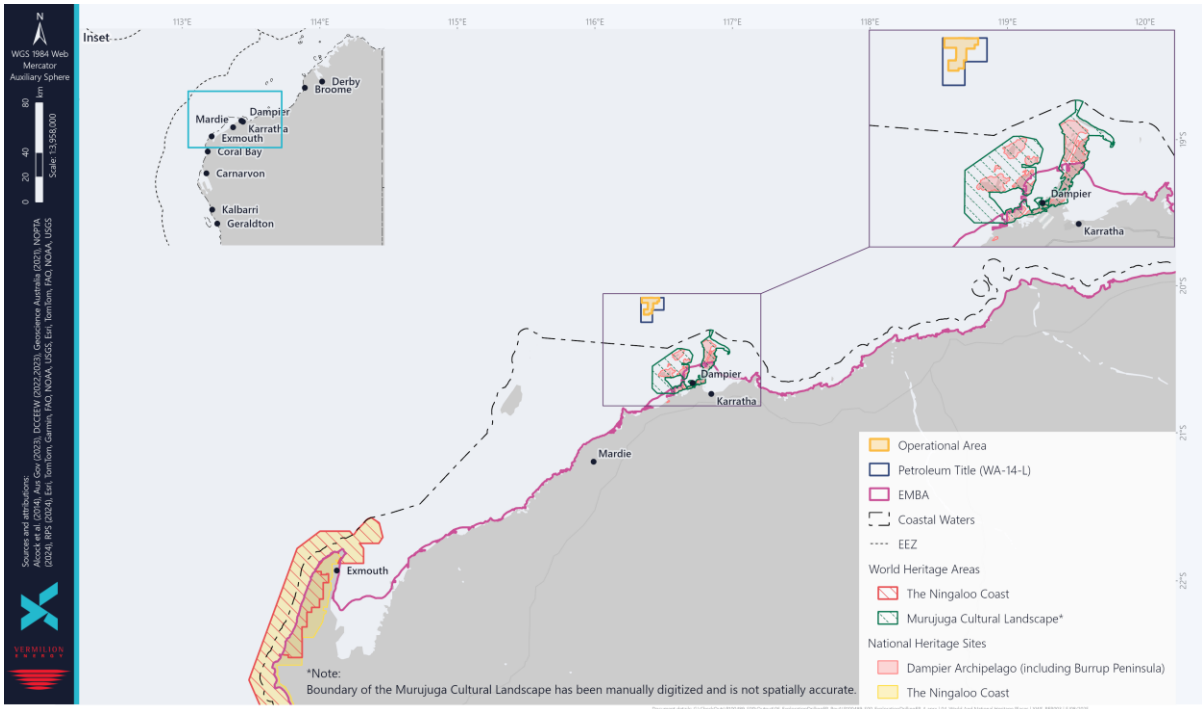
There are two World Heritage Properties located within the Hydrocarbon Area and EMBA (Figure 3-38), as discussed in Table 3-10. No World Heritage Properties overlap the Operational Area.

Table 3-10: World Heritage Properties within the Hydrocarbon Area and EMBA

World Heritage Places	Heritage Class	Project Areas		
		Operational Area	Hydrocarbon Area	EMBA
Murujuga Cultural Landscape	Criteria (i) (iii) (v)	-	✓	✓
Murujuga Cultural Landscape was inscribed to the World Heritage List in 2025. It is a landscape of ancient rocks encompassing the Burrup Peninsula, Dampier archipelago's 42 islands, and nearby marine areas. The site is shaped by First Nations Lore, rules and narratives that were put in place to create Country, and the enduring presence of the Ngarda-Ngarli people who are the Traditional Owners and custodians of the site. This property hold profound cultural and spiritual significance which reflects over 50,000 years of continuous care and use by Traditional Custodians. The site is renowned for its dense concentration of petroglyphs, which provide a record of traditional use by First Nations people over thousands of years. The engravings depict human figures, bird, marine and animal life, including				

World Heritage Places	Heritage Class	Project Areas		
		Operational Area	Hydrocarbon Area	EMBA
some extinct species. The area also features middens, fish traps, rock shelters, ceremonial places, spiritual and sacred sites, and stone arrangements (UNESCO, 2025).				
Ningaloo Coast	Natural Criterion vii and Criterion x	-	✓	✓
The Ningaloo Coast World Heritage Property has been included in the World Heritage list since 2011. spans over 705,015 hectares of marine and terrestrial areas on the western coast of Australia. The marine area features the Ningaloo Reef, one of the longest fringing reefs in the world. An estimated 300 to 500 whale sharks (*Rhincodon typus*) aggregate annually on the reef coinciding with mass coral spawning events. The marine area has a high diversity of habitats which include lagoon, reef, open ocean, and the continental slope and continental shelf. Intertidal systems include tock shore, sandy beaches, estuaries, and mangroves. The most dominant marine habitat is the Ningaloo Reef. The reef supports both tropical and temperate marine fauna and features annual gatherings of whale sharks and sea turtles. The terrestrial area of this site features an extensive karst system with substantial cave networks, and groundwater streams. Universal values of this site include high terrestrial species endemism and high marine diversity and abundance. Criterion (vii): The landscapes and seascapes of the Ningaloo Coast are mostly intact, large-scale marine, coastal and terrestrial environments. The property supports rare and large aggregations of whale sharks and other fish species, marine mammals and reptiles. The aggregations in Ningaloo follow the mass seasonal coral spawning and nutrient upwelling which leads to increased productivity and the largest gathering of whale sharks in the world. Criterion (x): The Ningaloo reef is home to a high diversity of coral, fish, mollusc, crustacean, algae, sponge, and echinoderm species. Many species that occur in the region are rare or threatened. It is estimated that 10,000 nests of marine turtles occur annually along the coastline. There are rare aquatic species found in the flooded caves on land which are rare, taxonomically diverse and not found anywhere else in the southern hemisphere. The subterranean fauna and flora of the Ningaloo peninsula is highly diverse (IUCN, 2011).				

Figure 3-38: World and National Heritage Sites in the vicinity of the Operational Area[1]



3.6.2 National Heritage Places

The National Heritage List is Australia's list of natural, historic and Indigenous places of outstanding significance to Australia. There are 2 National Heritage Places identified to occur within the EMBA and Hydrocarbon Area (Figure 3-38), as discussed in Table 3-11. No National Heritage Places occur within the Operational Area.

Table 3-11: National Heritage Places within the Hydrocarbon Area and EMBA

National Heritage Places	Heritage Class	Project Areas		
		Operational Area	Hydrocarbon Area	EMBA
Dampier Archipelago (including Burrup Peninsula)	Indigenous	-	✓	✓
Description The Dampier Archipelago is located 1,550 km north of Perth and was listed for inscription in 2007. This site is home to one of the most remarkable collections of rock art in Australia. The archipelago was formed 6000-8000 years ago and is made up of islands, reefs, shoals, channels, and straits and spans over approximately 400 km^2. Many significant species of flora and fauna are found in the area. **Values** The Dampier Archipelago is a culturally significant area which has been home to the Ngarda-Ngarlie people for tens of thousands of years. There is great richness and diversity of rock art in the area and culturally significant site types ranging from quarries, middens, fish traps, rock shelters, ceremonial				

[1] The Murujuga World Heritage listed area is yet to be listed in Australian Government spatial defining software. The spatial location has been digitised according to the nominated listing for the Murujuga Cultural landscape Nominated World Heritage Property listing (CoA, 2023).

National Heritage Places	Heritage Class	Project Areas		
		Operational Area	Hydrocarbon Area	EMBA
sites, artefact scatters, and stone arrangements. Engravings are the most numerous site types with sites ranging in the potential millions. The Dampier Archipelago (including Burrup Peninsula) national heritage listing criteria a, b, c, d, and f (Commonwealth of Australia, 2007).				
HMAS *Sydney II* and *HSK Kormoran* Shipwreck Sites	Historic	-	-	✓
Description The shipwrecks of the HMAS *Sydney II* and HSK *Kormoran* and the associated debris are located 22 km apart and 290 km south west of Carnarvon in 2,500 m of water. The two ships were sunk after battle off the Western Australian coastline in 1941. The two ships were added to the National Heritage List in 2011. **Values** The shipwrecks sites have significant heritage value due to their importance in defining Australia's cultural history and for the crew members who lost their lives while defending Australia. HMAS *Sydney II* and HSK *Kormoran* Shipwreck Sites meets the national heritage listing criteria a, c, f, g, and h (Commonwealth of Australia, 2011a).				
The Ningaloo Coast	Natural	-	✓	✓
Description The Ningaloo Coast National Heritage Place consists of the same area included in the Ningaloo Coast World Heritage Property (Section 3.6.1) and was established on the National Heritage List in 2010. **Values** The Ningaloo Coast contains one of the best developed near-shore reefs in the world, being home to rugged limestone peninsulas, spectacular coral and sponge gardens and the whale shark (*Rhincodon typus*). The Ningaloo Coast meets the national heritage listing criteria a, b, c, d, and f (Commonwealth of Australia, 2010).				

3.6.3 Underwater Cultural Heritage

Australia's underwater cultural heritage is protected under the *Underwater Cultural Heritage Act 2018* (Cth) (UCH Act). This legislation protects shipwrecks, sunken aircraft and other types of underwater heritage, including Aboriginal underwater cultural heritage (Section 3.7.5 for Aboriginal cultural heritage) in Australian waters, including state and Commonwealth waters.

The remains of vessels and aircrafts located in Commonwealth waters, along with certain associated articles, are automatically protected under the *Underwater Heritage Act 2018* (Cth) after 75 years. This is applicable whether the existence or location of the article is known or unknown. Remains and relics of any ship that is lost, wrecked, or abandoned in WA waters before 1900 are protected by the *Maritime Archaeology Act 1973* (WA).

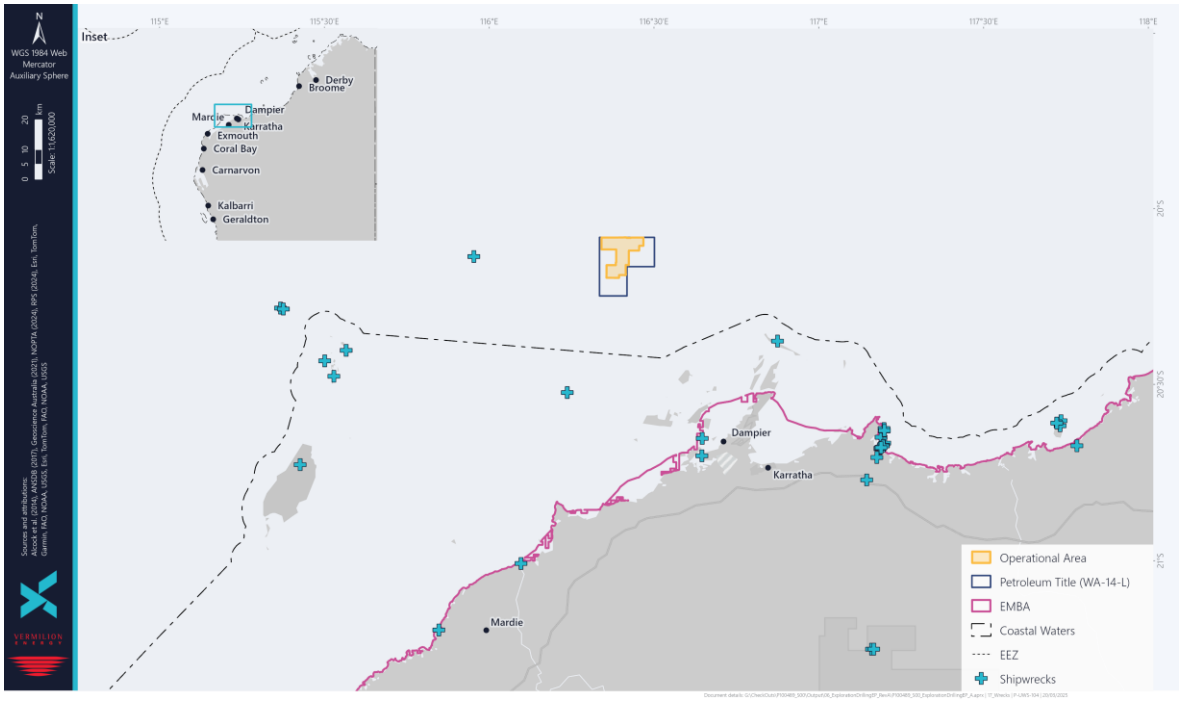
Known historical shipwreck sites in WA waters are listed in the WA Maritime Museum Shipwreck Database. Known historical shipwreck sites listed under the UCH Act in Australian waters are listed in the Australasian Underwater Cultural Heritage Database. These databases only cover known historical sites.

Known historical shipwreck sites in Western Australian waters are listed in the WA Maritime Museum Shipwreck Database. Known historical shipwreck sites in Australian waters are listed in the Australasian Underwater Cultural Heritage Database. These databases only cover known

historical sites. The Australasian Underwater Cultural Heritage Database identified one historic underwater cultural heritage artefact within the EMBA, the Point Samson Unidentified Shipwreck. There are no cultural heritage artefacts within the Operational Area (Figure 3-39).

There are 138 shipwreck and associated artefacts identified within the EMBA. There are no shipwrecks located within the Operational Area. The closest artefact is the Dampier shipwreck which is located 38.2 km from the Operational Area. Historical shipwrecks ad artefacts are listed in Appendix H.

Figure 3-39: Shipwrecks in the vicinity of the Operational Area



3.6.4 Australian Marine Parks

Australian Marine Parks (AMPs) are marine protected areas in Commonwealth waters, which aim to conserve diverse marine life and habitats and are part of Australia's National Representative System of Marine Protected Areas. There are 10 AMPs listed within the EMBA and 6 within the Hydrocarbon Area. There are no AMPs located within the Operational Area (Table 3-12) (Figure 3-40).

Table 3-12: Australian Marine Parks within the Hydrocarbon Area and EMBA

Australian Marine Park	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
Abrolhos	National Park Zone (IUCN II) Special Purpose Zone (IUCN VI) Multiple Use Zone (IUCN VI)	-	✓	✓	775 km southwest

Australian Marine Park	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
	Habitat Protection Zone (IUCN IV)				

Description

The Abrolhos Marine Park is located adjacent to the Western Australian Houtman Abrolhos Islands, covering a large offshore area extending from the Western Australian state water boundary to the edge of Australia's exclusive economic zone. It is located approximately 27 km south-west of Geraldton and extends north to approximately 330 km west of Carnarvon. The northernmost part of the shelf component of the Marine Park, north of Kalbarri, is adjacent to the Shark Bay World Heritage Area. The Marine Park covers an area of 88,060 km² and a water depth range between less than 15 m and 6000 m.

Natural values

The Marine Park supports a range of species listed under the EPBC Act. Biologically important areas within the Marine Park include foraging and breeding habitat for seabirds, foraging habitat for Australian sea lions and white sharks, and a migratory pathway for humpback and pygmy blue whales. The Marine Park is adjacent to the northernmost Australian sea lion breeding colony in Australia on the Houtman Abrolhos Islands.

Cultural values

Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. The Nanda and Naaguja People have responsibilities for sea country in the Marine Park. Traditional owners have strong stories that connect ocean and land. Artefacts from ancestors are abundant on islands in the adjacent state marine park. The Yamatji Marlpa Aboriginal Corporation is the Native Title Representative Body for the Yamatji region.

Social and economic values

Tourism, commercial fishing, mining, recreation including fishing, are important activities in the Marine Park (DNP, 2018b).

Argo-Rowley Terrace	Multiple Use Zone (IUCN VI) Special Purpose Zone (Trawl) (IUCN VI) National Park Zone (IUCN II)	-	-	✓	262 km north

Description

The Argo–Rowley Terrace Marine Park is located approximately 270 km north-west of Broome, Western Australia, and extends to the limit of Australia's exclusive economic zone. This AMP covers an area of 146,003 km^2 and water depths between 220 m and 6,000 m, protecting ecological communities in the deep offshore region. The AMP provides connectivity between the Mermaid Reef Marine Park and WA Rowley Shoals Marine Park.

Natural values

The Marine Park includes a range of seafloor features such as canyons on the slope between the Argo Abyssal Plain, Rowley Terrace and Scott Plateau. These are believed to be up to 50 million years old and are associated with small, periodic upwellings that results in localised higher levels of biological productivity. The Marine Park includes species listed under the EPBC Act. Biologically important areas within the Marine Park include resting and breeding habitat for seabirds and a migratory pathway for the pygmy blue whale.

Australian Marine Park	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
Cultural values Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. As noted in the 'North-west Marine Park Management Plan', limited information regarding the cultural significance of this marine park is currently available. **Heritage values** The Marine Park contains two known shipwrecks listed under the Historic Shipwrecks Act 1976: *Alfred* (wrecked in 1908) and *Pelsart* (wrecked in 1908). **Social and economic values** Socio-economic values of this Marine Park include commercial fishing and mining (DNP, 2018a).					
Carnarvon Canyon	Habitat Protection Zone (IUCN IV)	-	-	✓	619 km southwest
Description The Carnarvon Canyon Marine Park is located approximately 300 km north-west of Carnarvon. It covers an area of 6,177 km² and a water depth range of 1,500–6,000 m. **Natural values** The Marine Park includes ecosystems representative of the Central Western Transition—a bioregion characterised by large areas of continental slope, a range of topographic features such as terraces, rises and canyons, seasonal and sporadic upwelling, and benthic slope communities. It includes the Carnarvon Canyon, a single-channel canyon covering the entire depth range of the Marine Park. Ecosystems of the Marine Park are influenced by tropical and temperate currents, deep-water environments and proximity to the continental slope and shelf. The soft-bottom environment at the base of the Carnarvon Canyon is likely to support deep seafloor species (e.g. holothurians, polychaetes and sea-pens). The Marine Park supports a range of species listed under the EPBC Act. **Cultural values** Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. **Social and economic values** Commercial fishing is an important activity in the Marine Park (DNP, 2018a).					
Dampier	National Park Zone (IUCN II) Habitat Protection Zone (IUCN IV) Multiple Use Zone (IUCN VI)	-	✓	✓	56 km southeast
Description The Dampier Marine Park is located approximately 10 km north-east of Cape Lambert and 40 km from Dampier, extending from the Western Australian state water boundary. The Marine Park covers an area of 1,252 km² and a water depth range between less than 15 m and 70 m. **Natural values** The Marine Park includes ecosystems representative of the Northwest Shelf Province—a dynamic environment influenced by strong tides, cyclonic storms, long-period swells and internal tides. The					

Australian Marine Park	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
bioregion includes diverse benthic and pelagic fish communities, and ancient coastline thought to be an important seafloor feature and migratory pathway for humpback whales. The Marine Park supports a range of species listed under the EPBC Act. Biologically important areas within the Marine Park include breeding and foraging habitat for seabirds, internesting habitat for marine turtles and a migratory pathway for humpback whales. **Cultural values** Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. The Ngarluma, Yindjibarndi, Yaburara, and Mardudhunera people have responsibilities for sea country in the Marine Park. The native title holders for these people are represented by the Ngarluma Aboriginal Corporation and Yindjibarndi Aboriginal Corporation. These Prescribed Body Corporates represent traditional owners with native title over coastal area adjacent to the Marine Park. The Yamatji Marlpa Aboriginal Corporation is the Native Title Representative Body for the Pilbara and Yamatji regions. **Social and economic values** Port activities, commercial fishing and recreation, including fishing, are important activities in the Marine Park (DNP, 2018a).					
Eighty Mile Beach	Multiple Use Zone (IUCN VI)	-	✓	✓	264 km east
Description The Eighty Mile Beach Marine Park is located approximately 74 km north-east of Port Hedland, adjacent to the Western Australian Eighty Mile Beach Marine Park. The Marine Park covers an area of 10,785 km² and a water depth ranges between less than 15 m and 70 m. **Natural values** The Marine Park includes examples of ecosystems representative of the Northwest Shelf Province—a dynamic environment influenced by strong tides, cyclonic storms, long-period swells and internal tides. The bioregion includes diverse benthic and pelagic fish communities, and ancient coastline thought to be an important seafloor feature and migratory pathway for humpback whales. The Marine Park supports a range of species listed under the EPBC Act. Biologically important areas within the Marine Park include breeding, foraging and resting habitat for seabirds, internesting and nesting habitat for marine turtles, foraging, nursing and pupping habitat for sawfish and a migratory pathway for humpback whales. **Cultural values** Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. The sea country of the Nyangumarta, Karajarri and Ngarla people extends into Eighty Mile Beach Marine Park. Sea country is culturally significant and important to their identity. They have an unbroken, deep spiritual connection to their sea country, with traditional practices continuing today. Staple foods of living cultural value for the Nyangumarta, Karajarri and Ngarla people include saltwater fish, turtles, dugong, crabs and oysters. Access to sea country by families is important for cultural traditions, livelihoods and future socio-economic development opportunities. The native title holders for the Nyangumarta, Karajarri and Ngarla people are represented by the Karajarri Aboriginal Corporation, Nyangumarta Karajarri Aboriginal Corporation, Nyangumarta Warrarn					

Australian Marine Park	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
Aboriginal Corporation, and Wanparta Aboriginal Corporation. These Prescribed Body Corporates represent traditional owners with native title over coastal area adjacent to the Marine Park. They are the points of contact for their respective areas of responsibility for sea country in the Marine Park. The Kimberley Land Council and the Yamatji Marlpa Aboriginal Corporation are the Native Title Representative Bodies for Kimberley and Pilbara regions. **Heritage values** The Marine Park contains three known shipwrecks listed under the Historic Shipwrecks Act 1976: *Lorna Doone* (wrecked in 1923), *Nellie* (wrecked in 1908), and *Tifera* (wrecked in 1923). **Social and economic values** Tourism, commercial fishing, pearling and recreation are important activities in the Marine Park.					
Gascoyne	Habitat Protection Zone (IUCN IV) National Park Zone (IUCN II) Multiple Use Zone (IUCN VI)	-	✓	✓	278 km southwest
Description The Gascoyne Marine Park is located approximately 20 km off the west coast of the Cape Range Peninsula, adjacent to the Ningaloo Reef Marine Park and the Western Australian Ningaloo Marine Park and extends to the limit of Australia's exclusive economic zone. The Marine Park covers an area of 81,766 km² and water depths between 15 m and 6,000 m. **Natural values** Ecosystems represented in the Marine Park are influenced by the interaction of the Leeuwin Current, Leeuwin Undercurrent and the Ningaloo Current. The Marine Park supports a range of species listed under the EPBC Act. Biologically important areas within the Marine Park include breeding habitat for seabirds, internesting habitat for marine turtles, a migratory pathway for humpback whales, and foraging habitat and migratory pathway for pygmy blue whales. **Cultural values** Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. The Gnulli people have responsibilities for sea country in the Marine Park. The Yamatji Marlpa Aboriginal Corporation is the Native Title Representative Body for the Yamatji region. **Heritage values** The Ningaloo Coast was listed as an area of outstanding universal value under the World Heritage Convention in 2011, meeting world heritage listing criteria vii and x. The Ningaloo Coast World Heritage Property is adjacent to the Marine Park. The Ningaloo Marine Area (Commonwealth waters) meets the Commonwealth heritage listing criteria A, B and C. The Ningaloo Marine Area is adjacent to the Marine Park. The Ningaloo Coast meets the national heritage listing criteria A, B, C, D, and F and is adjacent to the Marine Park. The Marine Park contains more than five known shipwrecks listed under the *Historic Shipwrecks Act 1976.* **Social and economic values** Commercial fishing, mining and recreation are important activities in the Marine Park (DNP, 2018a).					

Australian Marine Park	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
Mermaid Reef	National Park Zone (IUCN II)	-	-	✓	464 km northeast

Description

The Mermaid Reef Marine Park is located approximately 280 km north-west of Broome, adjacent to the Argo–Rowley Terrace Marine Park and approximately 13 km from the Western Australian Rowley Shoals Marine Park. The Marine Park covers an area of 540 km² and water depths from less than 15 m to 500 m.

Mermaid Reef is one of three reefs forming the Rowley Shoals. The reefs of the Rowley Shoals are significant as they are considered ecological stepping stones for reef species originating in Indonesian/Western Pacific waters, are one of a few offshore reef systems on the north-west shelf, and may also provide an upstream source for recruitment to reefs further south.

Natural values

The Marine Park includes examples of ecosystems representative of the Northwest Transition—an area of shelf break, continental slope, and the majority of the Argo Abyssal Plain. Together with Clerke Reef and Imperieuse Reef, Mermaid Reef is a biodiversity hotspot and key topographic feature of the Argo Abyssal Plain. A key ecological feature of the Marine Park is the Mermaid Reef and Commonwealth waters surrounding Rowley Shoals. Ecosystems of the Marine Park are associated with emergent reef flat, deep reef flat, lagoon, and submerged sand habitats. The Marine Park supports a range of species listed under the EPBC Act. Biologically important areas within the Marine Park include breeding habitat for seabirds and a migratory pathway for the pygmy blue whale.

Cultural values

Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. As noted in the 'North-west Marine Park Management Plan', there is limited information about the cultural significance of this Marine Park.

Heritage values

Mermaid Reef–Rowley Shoals was established on the Commonwealth Heritage List in 2004, meeting Commonwealth heritage listing criteria A, B, C and D.
The Marine Park contains one known shipwreck listed under the *Historic Shipwrecks Act 1976*: Lively (wrecked in 1810).

Social and economic values

Tourism, recreation, and scientific research are important activities in the Marine Park (DNP, 2018a)

Montebello	Multiple Use Zone (IUCN VI)	-	✓	✓	37 km west

Description

The Montebello Marine Park is located offshore of Barrow Island and 80 km west of Dampier extending from the Western Australian state water boundary, and is adjacent to the Western Australian Barrow Island and Montebello Islands Marine Parks. The Marine Park covers an area of 3,413 km² and water depths from less than 15 m to 150 m.

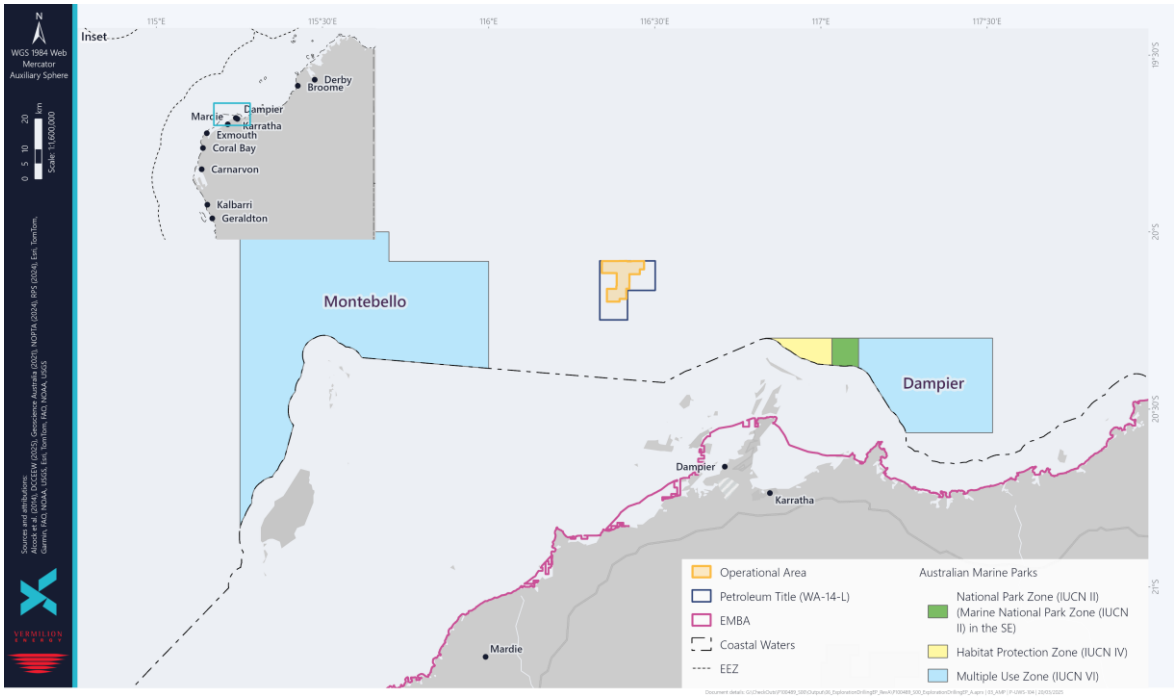
Natural values

The Marine Park includes examples of ecosystems representative of the Northwest Shelf Province—a dynamic environment influenced by strong tides, cyclonic storms, long-period swells and internal tides. The bioregion includes diverse benthic and pelagic fish communities. A key ecological feature of the Marine Park is the ancient coastline at the 125-m depth contour.

Australian Marine Park	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
The Marine Park supports a range of species listed under the EPBC Act. Biologically important areas within the Marine Park include breeding habitat for seabirds, internesting, foraging, mating, and nesting habitat for marine turtles, a migratory pathway for humpback whales and foraging habitat for whale sharks. **Cultural values** The Yamatji Marlpa Aboriginal Corporation is the Native Title Representative Body for the Pilbara region. Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. As noted in the 'North-west Marine Park Management Plan', there is limited information about the cultural significance of this Marine Park. **Heritage values** The Marine Park contains two known shipwrecks listed under the *Historic Shipwrecks Act 1976*: *Trial* (wrecked in 1622), the earliest known shipwreck in Australian waters and *Tanami* (unknown date). **Social and economic values** Tourism, commercial fishing, mining and recreation are important activities in the Marine Park (DNP, 2018a).					
Ningaloo	Recreational Use Zone (IUCN IV) National Park Zone (IUCN II)	-	✓	✓	276 km southwest
Description The Ningaloo Marine Park stretches approximately 300 km along the west coast of the Cape Range Peninsula, and is adjacent to the Western Australian Ningaloo Marine Park and Gascoyne Marine Park. The Marine Park covers an area of 2,435 km² and a water depth range of 30 m to more than 500 m. The Marine Park provides connectivity between deeper offshore waters of the shelf break and coastal waters of the adjacent Western Australian Ningaloo Marine Park. It includes some of the most diverse continental slope habitats in Australia, including the continental slope area between North West Cape and the Montebello Trough. Canyons in the Marine Park are important for sustaining the nutrient conditions that support the high diversity of Ningaloo Reef. **Natural values** Ecosystems represented in the Marine Park are influenced by interaction of the Leeuwin Current, Leeuwin Undercurrent and the Ningaloo Current. The Marine Park supports a range of species listed under the EPBC Act. Biologically important areas within the Marine Park include breeding and or foraging habitat for seabirds, internesting habitat for marine turtles, a migratory pathway for humpback whales, foraging habitat and migratory pathway for pygmy blue whales, breeding, calving, foraging and nursing habitat for dugong and foraging habitat for whale sharks. **Cultural values** Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. The Gnulli people have responsibilities for sea country in the Marine Park. The Yamatji Marlpa Aboriginal Corporation is the Native Title Representative Body for the Yamatji region.					

Australian Marine Park	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
Heritage values The Marine Park is within the Ningaloo Coast World Heritage Property, meeting world heritage listing criteria vii and x. The area is valued for high terrestrial species endemism, marine species diversity and abundance, and the interconnectedness of large-scale marine, coastal and terrestrial environments. The area connects the limestone karst system and fossil reefs of the ancient Cape Range to the nearshore reef system of Ningaloo Reef, to the continental slope and shelf in Commonwealth waters. The Ningaloo Coast overlaps the Marine Park, meeting the national heritage listing criteria A, B, C, D, and F. The Ningaloo Marine Area (Commonwealth waters) meets Commonwealth heritage listing criteria A, B and C. The Ningaloo Marine Area overlaps the Marine Park. The Marine Park contains more than 15 known shipwrecks listed under the *Historic Shipwrecks Act 1976*. **Social and economic values** Tourism and recreation, including fishing, are important activities in the Marine Park (DNP, 2018a).					
Shark Bay	Multiple Use Zone (IUCN VI)	-	✓	✓	565 km southwest
Description The Shark Bay Marine Park is located approximately 60 km offshore of Carnarvon, adjacent to the Shark Bay world heritage property and national heritage place. The Marine Park covers an area of 7,443 km², extending from the Western Australian state water boundary, and a water depth range between 15 m and 220 m. **Natural values** Ecosystems represented in the Marine Park are influenced by the Leeuwin, Ningaloo and Capes currents. The Marine Park supports a range of species listed under the EPBC Act. Biologically important areas within the Marine Park include breeding habitat for seabirds, internesting habitat for marine turtles, and a migratory pathway for humpback whales. The Marine Park and adjacent coastal areas are also important for shallow-water snapper. **Cultural values** Sea country is valued for Indigenous cultural identity, health and wellbeing. Across Australia, Indigenous people have been sustainably using and managing their sea country for tens of thousands of years. The Gnulli and Malgana people have responsibilities for sea country in the Marine Park. The Yamatji Marlpa Aboriginal Corporation is the Native Title Representative Body for the Yamatji region. **Heritage values** The Marine Park contains approximately 20 known shipwrecks listed under the *Historic Shipwrecks Act 1976.* **Social and economic values** Tourism, commercial fishing, mining and recreation, including fishing, are important activities in the Marine Park (DNP, 2018a).					

Figure 3-40: AMPs in the vicinity of the Operational Area



3.6.5 State Marine Protected Areas

The EMBA intersects with 5 WA state marine protected areas. The Hydrocarbon Area intersects 3 state marine protected areas. There are no state protected marine areas that intersect with the Operational Area (Table 3-13).

Table 3-13: State Marine Protected Areas within the Project Areas

Protected area name	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
Eighty Mile Beach	Marine Park	-	-	✓	311 km east
Description Eighty Mile Beach Marine Park covers ~2,000 km^2 stretching across 220 km of coastline between Port Hedland and Broome. **Conservation values** Eighty Mile Beach Marine Park is one of the world's most important feeding grounds for small wading birds that migrate to the area each summer, travelling from countries thousands of kilometres away. The marine park is a major nesting area for flatback turtles which are found only in northern Australia. Sawfishes, dugongs, dolphins and millions of invertebrates inhabit the sand and mud flats, seagrass meadows, coral reefs and mangroves. **Cultural values** The Karajarri, Nyangumarta and Ngarla people have a powerful connection to the land and sea of this region. Traditional hunting and fishing are important cultural activities for the traditional owners of this marine park.					

Protected area name	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
Social and economic values Social values of the marine park include tourism, nature-based recreational activities and commercial fishing (DPAW, 2014).					
Montebello Islands and Barrow Islands (Jointly Managed)	Marine Park Conservation Park Marine Management Area	-	✓	✓	76 km southwest
Description The Montebello Islands Marine Park and Barrow Islands Marine Park is located off the north-west coast of WA, ~1,600 km north of Perth, and cover areas of ~583 km^2, 42 km^2 and 1,147 km^2, respectively. **Conservation values** The Montebello/Barrow islands marine conservation reserves have very complex seabed and island topography, resulting in a myriad of different habitats subtidal coral reefs, macroalgal and seagrass communities, subtidal soft-bottom communities, rocky shores and intertidal reef platforms, which support a rich diversity of invertebrates and finfish. The reserves are important breeding areas for several species of marine turtles and seabirds, which use the undisturbed sandy beaches for nesting. Humpback whales migrate through the reserves and dugongs occur in the shallow warm waters (DEC, 2007a).					
Ningaloo and Murion Islands Marine Management area (Jointly Managed)	Marine Management Area Marine Park	-	✓	✓	275 km southwest
Description The Ningaloo Marine Park and Muiron Islands Marine Management Area are located off the North-west Cape of WA, ~1,200 km north of Perth, and cover areas of ~2,633 km^2 and 286 km^2, respectively. **Ecological values** Ningaloo Reef is the largest fringing coral reef in Australia. Temperate and tropical currents converge in the Ningaloo region resulting in highly diverse marine life including spectacular coral reefs, abundant fishes and species with special conservation significance such as turtles, whale sharks, dugongs, whales and dolphins. The region has diverse marine communities including mangroves, algae and filter-feeding communities and has high water quality. These values contribute to the Ningaloo Marine Park being regarded as the State's premier marine conservation icon. The Muiron Islands Marine Management Area is also important, containing a very diverse marine environment, with coral reefs, filter-feeding communities and macroalgal beds. In addition, the Islands are important seabird and green turtle nesting areas. **Cultural values** The Ningaloo Reef has a long history of occupancy by aboriginal communities and aboriginal heritage sites. The Jinigudira and Baiyungu people have lived on this region for thousands of years and use coastal areas for fishing, camping and hunting of turtles and dugongs. **Social and economic values** The Ningaloo region has a high number of visitors enjoying the area who come to appreciate nature-based tourism which is brings important economic value to the communities of the area (CALM, 2005).					

Protected area name	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
Pilbara Islands Nature Reserve (Great Sandy Island, Little Rocky Island , Thevenard Island, Unnamed WA51046)	Nature Reserve	-	✓	✓	167 km southwest

Great Sandy Island, Little Rocky Island, Thevenard Island, and Unnamed WA51046 Nature Reserves were identified to be within the EMBA. Thevenard Island and Great Sandy Island Nature Reserves were identified to be within the Hydrocarbon Area. No Nature Reserves were identified within the Operational Area.

Description

Located between the Ningaloo Coast World Heritage Area and the Dampier Archipelago, the Pilbara Islands Nature Reserve includes 174 small islands with a combined area of over 130 km^2 and a total coastline of over 500 km. Islands within this management area are characterised by foredunes surrounding a central depression and less than 12 m in elevation.

Conservation values

The islands provide a refuge for threatened and migratory species including the critically endangered eastern curlew, great knot, curlew sandpiper. The islands provide nesting beaches for the green, flatback, hawksbill and loggerhead turtles. Mangrove thickens are found on some of the islands which provide essential habitat for coastal species and shorebirds.

Cultural values

The Nganhurra Thanadri Garrbu Aboriginal Corporation and the Wirrawandi Aboriginal Corporation have native title determinations over parts of the planning area. The area holds significant cultural value to First Nations people. Culturally significant sites, places and species are found within the area. Customery activities including hunting, ceremonies and sharing of traditional knowledge is practiced in the region. Thevenard Island contains one registered site under the *Aboriginal Heritage Act 1972*, which indludes a midden scatter with three baler shell containers. Aboriginal artefacts have been found on some of the islands including a burial site, stone and glass flakes, brunt shell and bone and baler shells. Some of the islands were possibly occupied by First Nations people of the region.

Social and economic values

Visitation to the islands is low and only is by private boat and commercial accommodation is only available at Thevenard Island. Recreational fishing is undertaken around the islands. Thevenard Island previously was utilised as a base for an oil and gas facility but is now being decommissioned (DBCA, 2020a).

Rowley Shoals	Marine Park	-	-	✓	366 km northeast

Description

The Rowley Shoals comprise of three reef systems, Mermaid Reef, Clerke Reef and Imperieuse Reef, all 30-40 km apart. These reef systems are located ~300 km west north-west of Broome.

Conservation values

The three coral atolls of the Rowley Shoals Marine Park comprise of shallow lagoons inhabited by diverse corals and abundant marine life, each covering around 80 km^2 at the edge of Australia's continental shelf.

Protected area name	Area type	Project Areas			Distance and direction from Operational Area
		Operational Area	Hydrocarbon Area	EMBA	
Further offshore, the seafloor slopes away to the abyssal plain, some 6,000 m below. Undersea canyons slice the slope; these features are commonly associated with diverse communities of deep-water corals and sponges and create localised upwellings that aggregate pelagic species like tunas and billfish. **Social and economic values** Due to its remote location, the Rowley Shoals has low numbers of visitors with most arriving aboard licenced charter boats. Popular activities in the area include scuba diving, recreational fishing, and boating (DEC, 2007b).					

3.6.6 Wetlands of International Importance

Eighty-mile Beach Ramsar site is located within the EMBA. Located between Port Headland and Broome and located 346 km east of the Operational Area. The Ramsar site is made up of Eighty-mile Beach and, 40 km to the east, Mandora Salt Marsh. Eighty-mile Beach is a 220 km section of coastline and adjacent intertidal mudflats. Mandora Salt Marsh includes two large seasonal wetlands and a series of small permanent mound springs (DPAW, 2014).

Eighty-mile Beach Ramsar site represents the greatest extent of continuous intertidal mudflat in excellent condition within the Northwest IMCRA bioregion. In addition, Mandora Salt Marsh contains an important and rare group of wetlands within the arid North Western Plateau bioregion. In particular the peat mound springs can be considered both bioregionally rare and outstanding examples of this wetland type in Western Australia. The site supports the EPBC listed flatback turtle and is also considered one of the most important sites for stop-over and feeding by migratory shorebirds in Australia. The Mandora Salt Marsh contains temporary and permanent wetlands in a predominantly arid bioregion (Western Plateau) and has been recognised as important refugia for biological diversity in arid Australia. The inland grey mangroves lining Salt Creek represent the most inland occurrence of this species (DPAW, 2014).

3.6.7 Key Ecological Features

The EMBA intersects 11 Key Ecological Features (KEFs) and the Hydrocarbon Area intersects 8 KEFs as described in Table 3-14 (Figure 3-41). The Operational Area does not intersect any KEFs.

Table 3-14: Key Ecological Features within the EMBA

Key Ecological Feature	Project Areas			Distance and direction from Operational Area
	Operational Area	Hydrocarbon Area	EMBA	
Ancient coastline at 125 m depth contour	-	✓	✓	62 km north
National and/or regional importance The ancient coastline at 125 m depth contour is defined as a key ecological feature as it is a unique seafloor feature with ecological properties of regional significance.				

Key Ecological Feature	Project Areas			Distance and direction from Operational Area
	Operational Area	Hydrocarbon Area	EMBA	
Location The shelf of the NWMR contains several terraces and steps which reflect changes in sea level that occurred over the last 100,000 years. The most prominent of these features occurs as an escarpment along the NWS and Sahul Shelf at a depth of 125 m. The spatial boundary of this KEF is defined by depth range 115–135 m in the Northwest Shelf Province and Northwest Shelf Transition IMCRA provincial bioregions. **Description and values** The ancient submerged coastline provides areas of hard substrate and therefore may provide sites for higher diversity and enhanced species richness relative to surrounding areas of predominantly soft sediment. Little is known about fauna associated with the hard substrate of the escarpment, but it is likely to include sponges, corals, crinoids, molluscs, echinoderms and other benthic invertebrates representative of hard substrate fauna in the NWS bioregion. The escarpment may also facilitate increased availability of nutrients off the Pilbara by interacting with internal waves and enhancing vertical mixing of water layers. Enhanced productivity associated with the sessile communities and increased nutrient availability may attract larger marine life such as whale sharks (*Rhincodon typus*) and large pelagic fish. Humpback whales (*Megaptera novaeangliae*) appear to migrate along the ancient coastline, using it as a guide to move through the region (DCCEEW, 2024d).				
Canyons linking the Argo Abyssal Plain with the Scott Plateau	-	-	✓	695 km northeast
National and/or regional importance The Canyons linking the Argo Abyssal Plain with the Scott Plateau are defined as a KEF for their high productivity and aggregations of marine life. These values apply to both the benthic and pelagic habitats within the feature. **Location** The spatial boundary of this KEF includes the three canyons adjacent to the south-west corner of Scott Plateau. The Bowers and Oates canyons are the largest canyons connecting the Scott Plateau with the Argo Abyssal Plain; they are situated in the Timor Province (IMCRA provincial bioregion), west of Scott Reef. **Description and values** The Bowers and Oats canyons are major canyons on the slope between the Argo Abyssal Plain and Scott Plateau. The canyons cut deeply into the south-west margin of the Scott Plateau at a depth of approx. 2,000–3,000 m, and act as conduits for transport of sediments to depths of more than 5,500 m on the Argo Abyssal Plain. Benthic communities at these depths are likely to be dependent on particulate matter falling from the pelagic zone to the sea floor. The water masses at these depths are deep Indian Ocean water on the Scott Plateau and Antarctic bottom water on the Argo Abyssal Plain; both water masses are cold, dense and nutrient-rich. The ocean above the canyons may be an area of moderately enhanced productivity, attracting aggregations of fish and higher-order consumers such as large predatory fish, sharks, toothed whales and dolphins. The canyons linking the Argo Abyssal Plain and Scott Plateau are likely to be important features due to their historical association with sperm whale aggregations. Noting that the reasons for these historical aggregations of marine life remains unclear (DCCEEW, 2024e).				

Key Ecological Feature	Project Areas			Distance and direction from Operational Area
	Operational Area	Hydrocarbon Area	EMBA	
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	-	✓	✓	232 km southwest

National and/or regional importance

The Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula are defined as a key ecological feature as they are unique seafloor features with ecological properties of regional significance, which apply to both the benthic and pelagic habitats within the feature.

Location

The largest canyons on the slope linking the Cuvier Abyssal Plain and Cape Range Peninsula are the Cape Range Canyon and Cloates Canyon which are located along the southerly edge of Exmouth Plateau adjacent to Ningaloo Reef. The canyons are unusual because their heads are close to the coast of North West Cape.

Description and values

The canyons on the slope of the Cuvier Abyssal Plain and Cape Range Peninsula are connected to the Commonwealth waters adjacent to Ningaloo Reef, and may also have connections to Exmouth Plateau. The canyons are thought to interact with the Leeuwin Current to produce eddies inside the heads of the canyons, resulting in waters from the Antarctic intermediate water mass being drawn into shallower depths and onto the shelf; these waters are cooler and richer in nutrients and strong internal tides may also aid upwelling at the canyon heads. The narrow shelf width (approximately 10 km) near the canyons facilitates nutrient upwelling and this nutrient-rich water interacts with the Leeuwin Current at the canyon heads. Aggregations of whale sharks, manta rays, humpback whales, sea snakes, sharks, large predatory fish and seabirds are known to occur in this area and are related to productivity.

The canyons, Exmouth Plateau and Commonwealth waters adjacent to Ningaloo Reef operate as a system to create the conditions for enhanced productivity seen in this region (DCCEEW, 2024f).

Commonwealth waters adjacent to Ningaloo Reef	-	✓	✓	275 km southwest

National and/or regional importance

The Commonwealth waters adjacent to Ningaloo Reef are defined as a KEF for their high productivity and aggregations of marine life, which apply to both the benthic and pelagic habitats.

Location

Ningaloo Reef extends >260 km along Cape Range Peninsula with a landward lagoon 0.2–6 km wide. Seaward of the reef crest, the reef drops gently to depths of 8–10 m; the waters reach 100 m depth, 5–6 km beyond the reef edge. Commonwealth waters over the narrow shelf (10 km at its narrowest) and shelf break are contiguous with Ningaloo Reef and connected via oceanographic and trophic cycling.

Description and values

Ningaloo reef is globally significant as the only extensive coral reef in the world that fringes the west coast of a continent; it is also globally significant as a seasonal aggregation site for whale sharks. The Commonwealth waters adjacent to Ningaloo Reef and associated canyons and plateau are interconnected and support the high productivity and species richness of Ningaloo Reef. The Leeuwin and Ningaloo currents interact on the seaward side of the reef, leading to areas of enhanced productivity which support aggregations and migration pathways of whale sharks (*Rhincodon typus*), manta rays (*Manta alfredi*), humpback whales (*Megaptera novaeangliae*), sea snakes, sharks, large predatory fish and seabirds. Detrital input from phytoplankton production in surface waters and from higher-trophic consumers cycles back to the deeper waters of the shelf and slope. Deepwater biodiversity includes fish, molluscs, sponges, soft corals and gorgonians. Some of these sponge and

Key Ecological Feature	Project Areas			Distance and direction from Operational Area
	Operational Area	Hydrocarbon Area	EMBA	
filter-feeding communities appear to be significantly different to those of the Dampier Archipelago and Abrolhos Islands, indicating that the Commonwealth waters of Ningaloo Marine Park have some areas of potentially high and unique sponge biodiversity. The outer reef is marked by a well-developed spur and groove system of fingers of coral formations penetrating the ocean with coral sand channels in between. The spurs support coral growth, while the grooves experience strong scouring surges and tidal run-off and have little coral growth (DCCEEW, 2024g).				
Continental Slope Demersal Fish Communities	-	✓	✓	105 km northwest
National and/or regional importance This species assemblage is recognised as a key ecological feature because of its biodiversity values, including high levels of endemism. **Location** This KEF is defined as the area of slope found in the Northwest Province and Timor Province provincial bioregions, at the depth ranges of 220-500 m and 750-1,000 m. **Description and values** The diversity of demersal fish assemblages on the continental slope in the Timor Province, the Northwest Transition and the Northwest Province is high compared to elsewhere along the Australian continental slope. The continental slope between North West Cape and the Montebello Trough has >500 fish species, 76 of which are endemic, which makes it the most diverse slope bioregion in Australia. The slope of the Timor Province and the Northwest Transition also contains >500 species of demersal fish of which 64 are considered endemic. The Timor Province and Northwest Transition bioregions are the second-richest areas for demersal fish across the entire continental slope. The demersal fish species occupy two distinct demersal community types (biomes) associated with the upper slope (water depth of 225–500 m) and the mid-slope (750–1,000 m). Although poorly known, it is suggested that the demersal-slope communities rely on bacteria and detritus-based systems comprised of infauna and epifauna, which in turn become prey for a range of teleost fish, molluscs and crustaceans. Higher-order consumers may include carnivorous fish, deep-water sharks, large squid and toothed whales. Pelagic production is phytoplankton based, with hot spots around oceanic reefs and islands. Bacteria and fauna present on the continental slope are the basis of the food web for demersal fish and higher-order consumers in this system. Loss of benthic habitat along the continental slope at depths known to support demersal fish communities may lead to a decline in species richness, diversity and endemism associated with this feature (DCCEEW, 2024h).				

Key Ecological Feature	Project Areas			Distance and direction from Operational Area
	Operational Area	Hydrocarbon Area	EMBA	
Exmouth Plateau	-	✓	✓	213 km west

National and/or regional importance

The Exmouth Plateau is defined as KEF as it is a unique seafloor feature with ecological properties of regional significance, which apply to both the benthic and pelagic habitats.

Location

The Exmouth Plateau is located in the Northwest Province and covers an area of 49,310 km² in water depths of 800–4,000 m.

Description and values

Although the seascapes of this plateau are not unique, it is believed that the large size of Exmouth Plateau and its expansive surface may modify deep-water flow and be associated with the generation of internal tides; both of these features may contribute to the upwelling of deeper, nutrient-rich waters closer to the surface. The topography of the plateau (with valleys and channels), in addition to potentially constituting a range of benthic environments, may provide conduits for the movement of sediment and other material from the plateau surface through the deeper slope to the abyss.

The Exmouth Plateau is generally an area of low habitat heterogeneity; however, it is likely to be an important area of biodiversity as it provides an extended area offshore for communities adapted to depths of around 1,000 m. Sediments on the plateau suggest that biological communities include scavengers, benthic filter feeders and epifauna.

The plateau's surface is rough and undulating; the northern margin is steep and intersected by large canyons (e.g. Montebello and Swan canyons), the western margin is moderately steep and smooth and the southern margin is gently sloping and virtually free of canyons. Satellite observations suggest that productivity is enhanced along the northern and southern boundaries of the plateau and along the shelf edge, which in turn suggests that the plateau is a significant contributor to the productivity of the region.

Whaling records from the 19th century suggest that the Exmouth Plateau may have supported large populations of sperm whales (*Physeter macrocephalus*) (DCCEEW, 2024i).

Glomar Shoals	-	✓	✓	40 km northeast

National and/or regional importance

The Glomar shoals are defined as a KEF for their high productivity and aggregations of marine life.

Location

The Glomar Shoals are a submerged littoral feature located approximately 150 km north of Dampier on the Rowley Shelf at depths of 33–77 m.

Description and values

While the biodiversity associated with the Glomar Shoals has not been studied, the shoals are known to be an important area for a number of commercial and recreational fish species such as rankin cod (*Epinephelus multiinotatus*), brown striped snapper (*Lutjanus vitta*), red emperor (*Lutjanus sebae*), crimson snapper (*Lutjanus erythropterus*), bream (*Sparidae*) and yellow-spotted triggerfish (*Pseudobalistes fuscus*). These species have recorded high catch rates associated with the Glomar Shoals, indicating that the shoals are likely to be an area of high productivity.

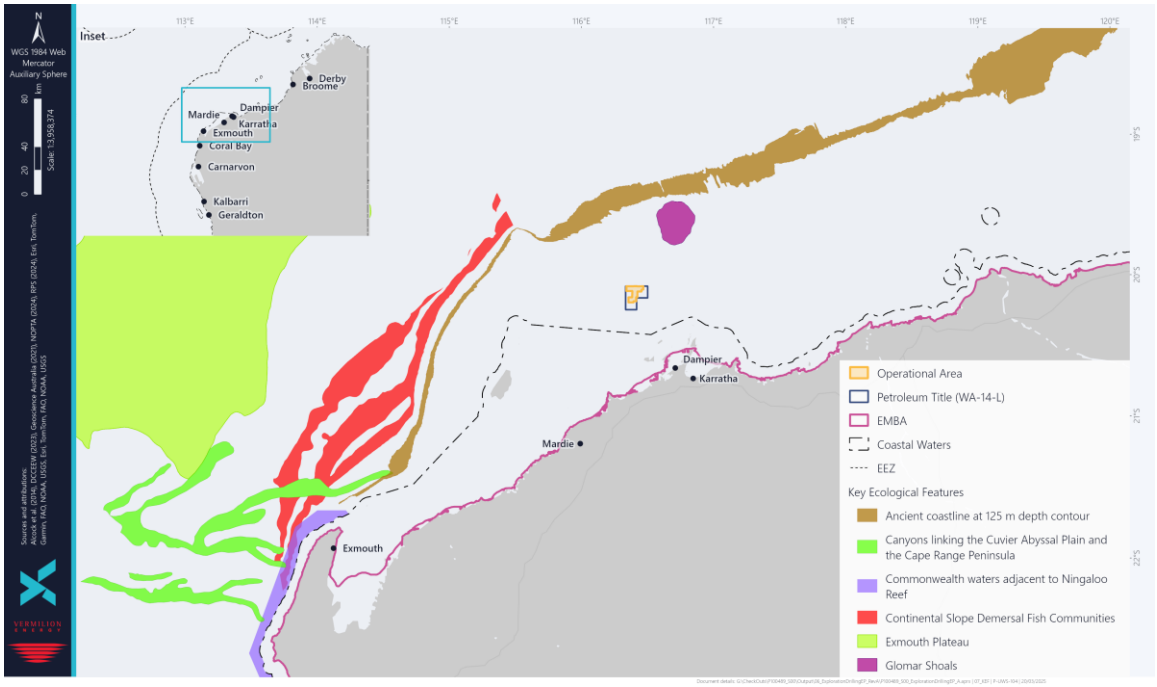
The shoals consist of a high percentage of marine-derived sediments with high carbonate content and gravels of weathered coralline algae and shells. The area's higher concentrations of coarse material in comparison to surrounding areas are indicative of a high-energy environment subject to strong sea-

Key Ecological Feature	Project Areas			Distance and direction from Operational Area
	Operational Area	Hydrocarbon Area	EMBA	
floor currents. Cyclones are also frequent in this area and stimulate periodic bursts of productivity as a result of increased vertical mixing (DCCEEW, 2024j).				
Mermaid Reef and Commonwealth waters surrounding Rowley Shoals	-	-	✓	358 km northeast
National and/or regional importance Mermaid Reef and Commonwealth waters surrounding Rowley Shoals is defined as a KEF for its enhanced productivity and high species richness, that apply to both the benthic and pelagic habitats. **Location** The Rowley Shoals are a collection of three atoll reefs (Clerke, Imperieuse and Mermaid) which are located approximately 300 km northwest of Broome. The KEF encompasses Mermaid Reef MP as well as waters from 3–6 nm surrounding Clerke and Imperieuse reefs. Mermaid Reef lies approximately 29 km north of Clerke and Imperieuse reefs and is totally submerged at high tide. Mermaid Reef falls under Commonwealth jurisdiction; while the Clerke and Imperieuse reefs are within the Rowley Shoals Marine Park and under State jurisdiction. **Description and values** Mermaid Reef and Commonwealth waters surrounding Rowley Shoals are regionally important in supporting high species richness, higher productivity and aggregations of marine life associated with the adjoining reefs. The Rowley Shoals contain 214 coral species, approximately 530 species of fish, 264 species of molluscs and 82 species of echinoderms; no sea snakes are known to occur. The reefs provide a distinctive biophysical environment in the region as there are few offshore reefs in the northwest. They have steep and distinct reef slopes and associated fish communities Enhanced productivity is thought to be facilitated by the breaking of internal waves in the waters surrounding the reefs, causing mixing and resuspension of nutrients from water depths of 500–700 m into the photic zone. The steep changes in slope around the reef also attract a range of migratory pelagic species including dolphins, tuna, billfish and sharks. Rowley Shoals' reefs are different from other reefs in the chain of reefs on the outer shelf of the NWMR, both in structure and genetic diversity. There is little connectivity between Rowley Shoals and other outer-shelf reefs. Both coral communities and fish assemblages of Rowley Shoals differ from similar habitats in eastern Australia. In evolutionary terms, the reefs may play a role in supplying coral and fish larvae to reefs further south via the southward flowing Indonesian Throughflow (DCCEEW, 2024k).				
Perth Canyon and adjacent shelf break, and other west coast canyons	-	✓	✓	932 km southwest
National and/or regional importance The Perth Canyon forms a major biogeographical boundary and it is defined as a KEF because it is an area of higher productivity that attracts feeding aggregations of deep-diving mammals and large predatory fish. It is also recognised as a unique seafloor feature with ecological properties of regional significance. **Location** The west coast system of canyons spans an extensive area (8,744 km²) of continental slope offshore from Kalbarri to south of Perth. It includes the Geographe, Busselton, Pelsaert, Geraldton, Wallaby, Houtman and Murchison canyons and, most notably, the Perth Canyon (offshore of Rottnest Island), which is Australia's largest ocean canyon.				

Key Ecological Feature	Project Areas			Distance and direction from Operational Area
	Operational Area	Hydrocarbon Area	EMBA	
Description and values The Perth Canyon is prominent among the west coast canyons because of its magnitude and ecological importance; however, the sheer abundance of canyons spread over a broad latitudinal range makes this feature important. In the Perth Canyon, interactions between the canyon topography and the Leeuwin Current induce clockwise-rotating eddies that transport nutrients upwards in the water column from greater depths. Due to the canyon's depth and the Leeuwin Current's barrier effect, this remains a subsurface upwelling (depths >400 m), which confers ecological complexity that is typically absent from canyon systems in other areas. The Perth Canyon also marks the southern boundary for numerous tropical species groups on the shelf, including sponges, corals, decapods and xanthid crabs. The Perth Canyon marks the southern boundary of the Central Western Province. Deep ocean currents upwelling in the canyon create a nutrient-rich, cold-water habitat that attracts deep-diving mammals and large predatory fish, which feed on small fish, krill and squid. A number of cetaceans, predominantly pygmy blue whales (*Balaenoptera musculus brevicauda*), aggregate in the canyon during summer to feed on the prey aggregations. Arriving from November onwards, their numbers peak in March to May. The topographical complexity of the canyon is also believed to provide more varied habitat that supports higher levels of epibenthic biodiversity than adjacent shelf areas (DCCEEW, 2024l).				
Wallaby Saddle	-	-	✓	777 km southwest
National and/or regional importance Wallaby saddle is defined as a KEF for its high productivity and aggregations of marine life; these values apply to both the benthic and pelagic habitats. **Location** The Wallaby Saddle covers 7,880 km² of seabed and is an abyssal geomorphic feature that connects the northwest margin of the Wallaby Plateau with the margin of the Carnarvon Terrace on the upper continental slope at a depth of 4,000–4,700 m. **Description and values** The Wallaby Saddle is regionally important in that it represents almost the entire area of this type of geomorphic feature in the NWMR. The Wallaby Saddle is located within the Indian Ocean water mass and is thus differentiated from systems to the north that are dominated by transitional fronts or the Indonesian Throughflow. Little is known about the Wallaby Saddle; however, the area is considered one of enhanced productivity and low habitat diversity. Historical sperm whale aggregations in the area of Wallaby Saddle may be attributable to higher productivity and aggregations of baitfish (DCCEEW, 2024m).				
Western demersal slope and associated fish communities	-	✓	✓	115 km west
National and/or regional importance The demersal slope and associated fish communities are recognised as a KEF for their high levels of biodiversity and endemism. **Location** This KEF extends from the edge of the shelf to the limit of the exclusive economic zone, between Perth and the northern boundary of the South-west Marine Region.				

Key Ecological Feature	Project Areas			Distance and direction from Operational Area
	Operational Area	Hydrocarbon Area	EMBA	
Description and values The western continental slope provides important habitat for demersal fish communities. In particular, the continental slope of the Central Western provincial bioregion supports demersal fish communities characterised by high diversity compared with other, more intensively sampled, oceanic regions of the world. Its diversity is attributed to the overlap of ancient and extensive Indo-west Pacific and temperate Australasian fauna. Approximately 480 species of demersal fish inhabit the slope of this bioregion, and 31 of these are considered endemic to the bioregion. A diverse assemblage of demersal fish species below a depth of 400 m is dominated by relatively small benthic species such as grenadiers, dogfish and cucumber fish. Unlike other slope fish communities in Australia, many of these species display unique physical adaptations to feed on the seafloor (such as a mouth position adapted to bottom feeding), and many do not appear to migrate vertically in their daily feeding habits (DCCEEW, 2024n).				

Figure 3-41: KEFs in the vicinity of the Operational Area



3.6.8 Threatened Ecological Communities

The EPBC Act provides for the listing of threatened ecological communities (TECs), and these are considered as MNES under the EPBC Act. There are no coastal EPBC listed TECs that occur within the EMBA, Hydrocarbon Area or Operational Area.

3.7 First Nations

Table 3-1 identifies that First Nations receptors within the Hydrocarbon Area and EMBA may be relevant to aspects of the drilling activities. The descriptions below provide sufficient details to assess all impacts and risks to First Nations.

3.7.1 Methodology to Identify Cultural Values and Sensitivities

The definition of environment in the OPGGS(E)R includes the people and communities, heritage value of places, and their social, economic, and cultural features. For First Nations peoples, this includes cultural heritage and sea country values which hold a spiritual and cultural connection that may be affected by the Petroleum Activity.

VOGA recognises First Nations Groups and their spiritual and cultural connection to the environment. Identification of First Nations cultural values and sensitivities was developed through consultation with First Nations groups with connection to Sea Country in the Operational Area and EMBA (refer to Section 9.3.4 for VOGA's consultation and methodology process).

3.7.2 Recognition of First Nations Groups

First Nations groups and Traditional Owners and connection to Country is recognised through contemporary legislation such as the Commonwealth *Native Title Act 1993* as well as various State laws such as the WA *Aboriginal Heritage Act 1972* (WA).

A review of the statutory laws, rights and recognition conferred to First Nations peoples relevant to the Project is summarised in the below sections.

3.7.3 Native Title

Native title is the formal recognition that Aboriginal and Torres Strait Islander people continue to have rights to land and waters according to their traditional laws and customs.

The Commonwealth *Native Title Act 1993* has the following objectives:

- Provide for the recognition and protection of Native Title
- Establish a mechanism for determining claims to Native Title
- Establish ways in which future dealings affecting Native Title (future acts) may proceed
- Provides for the validation of past acts and intermediate period acts invalidated because of the existence of native title.

Native title determination requires First Nation's people to establish and prove an unbroken and current connection to their lands and waters and cultural practices from the time of European settlement.

Native title can be granted with exclusive or non-exclusive rights to lands and waters. Exclusive rights can only be granted over limited parts of Australia, including areas already held by or for the use of Indigenous Australians, or unallocated/vacant Crown land. Non-exclusive native title can include, for example, the right to live on or hunt in an area co-existing with the rights of

other land users. In tidal and sea areas, only non-exclusive native title can be recognised. Exclusive native title is considered inconsistent with other common law rights regarding marine access and navigation (NNTT, 2010).

The *Native Title Act 1993* appoints Representative Aboriginal/Torres Strait Islander Bodies (RATSIB) as regional organisations with prescribed functions relating to facilitation and assistance, certification, dispute resolution, notifications and agreement making (NNTT, 2024). The EMBA overlaps the following RATSIB Areas:

- Kimberley: Kimberley Land Council Aboriginal Corporation
- Pilbara: Yamatji Marlpa Aboriginal Corporation
- Gascoyne-Midwest: Yamatji Marlpa Aboriginal Corporation.

The Federal Court of Australia first recognised native title over the sea for the Traditional Owners of Croker Island in Arnhem Land in 1998 (Tribunal File No. DCD 1998/001). Since the Croker Islands Seas native title determination, native title in Sea Country has been recognised along Australia's coastline through numerous claims and determinations under the *Native Title Act 1993.*

A search of the National Native Title Tribunal (NNTT) database identified eight Native Title determinations within the EMBA, as discussed in Table 3-15 and displayed in Figure 3-42.

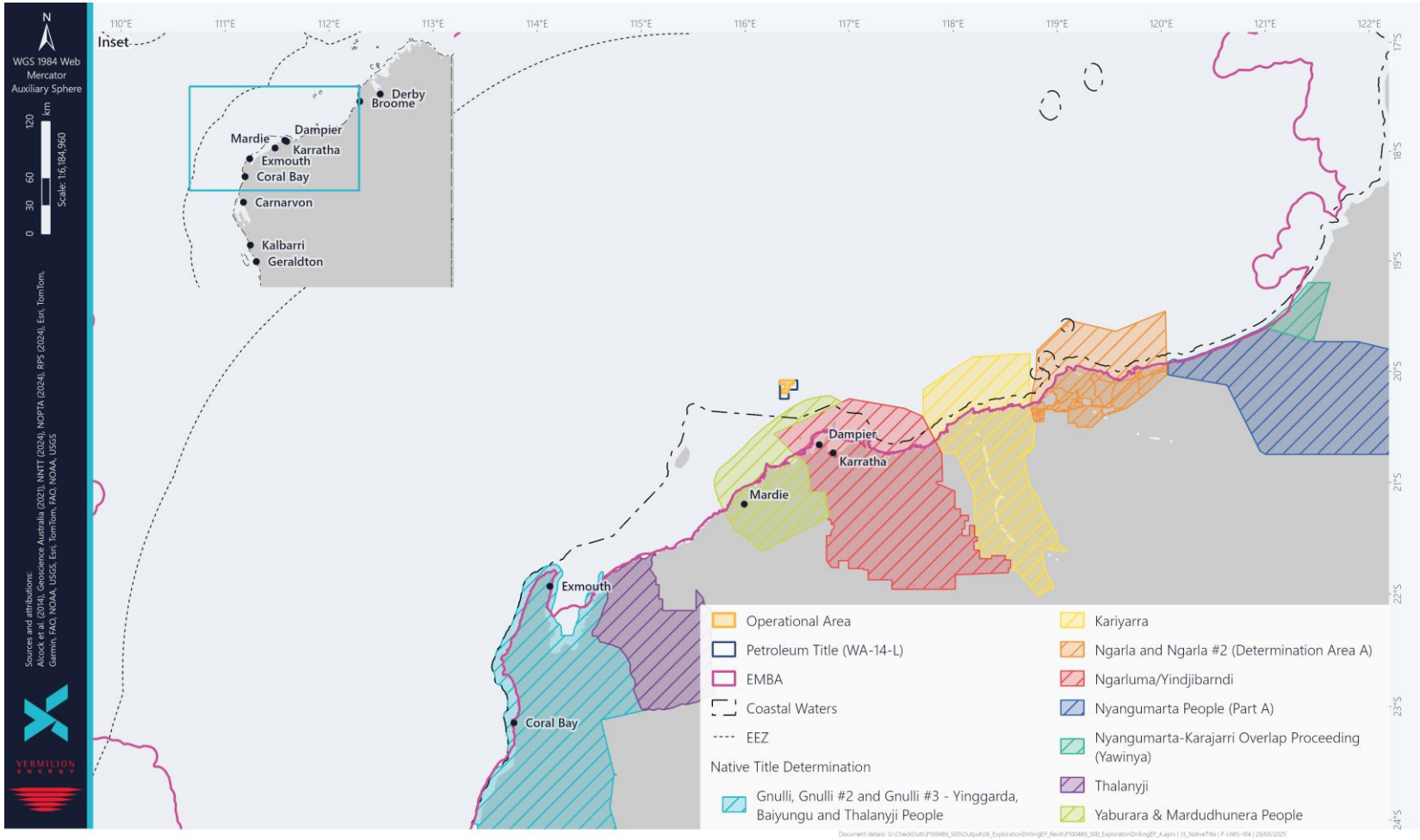
Table 3-15: Native Title Determinations within and/or coastally adjacent to the EMBA

Native Title Tribunal ID	Native Title Party	Prescribed Body Corporate	Description	EMBA overlap	Coastally adjacent
WCD2012/001	Nyangumarta-Karajarri Overlap Proceeding (Yawinya)	Nyangumarta Karajarri Aboriginal Corporation	The Nyangumarta-Karajarri Overlap Proceeding (Yawinya) determination area extends along the coast of the Eighty Mile Beach Marine Park (Section 3.6.5).	Yes	Yes
WCD2009/001	Nyangumarta People (Part A)	Nyangumarta Warrarn Aboriginal Corporation	The Nyangumarta People (Part A) determination area includes a stretch of coast along Eighty Mile Beach Marine Park (Section 3.6.5) and overlaps the Nyangumarta Warrarn Indigenous Protected Area.	Yes	Yes
WCD2007/003	Ngarla and Ngarla #2 (Determination Area A)	Wanparta Aboriginal Corporation	The Ngarla and Ngarla #2 determination area A is located in the shires of Broome and East Pilbara and the town of Port Hedland. Native title was determined to exist along the coast from Port Hedland east to Pardoo and was determined not to exist seaward of the lowest astronomical tide.	Yes	Yes
WCD2018/015	Kariyarra	Kariyarra Aboriginal Corporation	The Kariyarra determination area is located around Port Hedland, extending offshore beyond the state waters limit.	Yes	Yes
WCD2005/001	Ngarluma/Yindjibarndi	Yindjibarndi Aboriginal Corporation RNTBC, Ngarluma Aboriginal Corporation	The Ngarluma/Yindjibarndi determination area overlaps the city of Karratha, shire of Ashburton and town of Port Hedland. It contains several protected areas both onshore and offshore including Millstream Chichester National Park and parts of Murgaroona Range Nature Reserve and Dampier Marine Park.	Yes	Yes
WCD2018/006	Yaburara & Mardudhunera People	Wirrawandi Aboriginal Corporation	The Yaburara & Mardudhunera People determination area is west of Karratha to Mardie extending offshore east of Barrow Island and west and north of the Dampier archipelago.	Yes	Yes

Native Title Tribunal ID	Native Title Party	Prescribed Body Corporate	Description	EMBA overlap	Coastally adjacent
WCD2008/003	Thalanyji	Buurabalayji Thalanyji Aboriginal Corporation	The Thalanyji determination area is located in the shires of Ashburton and Exmouth. Native title was determined to exist along the coast west from Onslow along the coast into Urala, and inland to Nyang.	Yes	Yes
WCD2019/016	Gnulli, Gnulli #2 and Gnulli #3 - Yinggarda, Baiyungu and Thalanyji People	Nganhurra Thanardi Garrbu Aboriginal Corporation, Yinggarda Aboriginal Corporation	The Gnulli, Gnulli #2 and Gnulli #3 - Yinggarda, Baiyungu and Thalanyji People determination area is located north of Shark Bay along the coast to Exmouth encompassing the North West Cape, including Learmonth and coastal waters of the Exmouth Gulf past Tent Island, and overlapping Ningaloo Marine Park (Section 3.6.5).	Yes	Yes
WCD2015/007	Ngarluma People	Ngarluma Aboriginal Corporation	The Ngarluma determination area encompasses approximately 21.5 km^2, including the towns of Wickham, Point Samson, and Karratha, within the Shire of Roebourne.	Yes	Yes
WCD2006/001	Rubibi Community	Yawuru Native Title Holders Aboriginal Corporation	The Yawuru determination area includes approximately 5,300 km^2 of land in and around Broome in the West Kimberley region. More than half the Yawuru native title determination area includes Roebuck Plains pastoral lease which Yawuru hold exclusive possession native title rights over.	No	Yes
WCD2004/002	Karajarri People	Karajarri Traditional Lands Association (Aboriginal Corporation)	The Karajarri determination area encompasses vast area of land in the West Kimberley region. This area encompasses over 31,000 km^2, including both coastal and inland regions. The Karajarri people also manage the Karajarri IPA, a large area designated for protection and sustainable use of natural resources (Section 3.7.4.2).	No	Yes

Native Title Tribunal ID	Native Title Party	Prescribed Body Corporate	Description	EMBA overlap	Coastally adjacent
WCD2019/014	Malgana Part A	Malgana Aboriginal Corporation	The determination area encompasses approximately 28,000 km^2 of land and waters in the southern Gascoyne region of Western Australia, including much of Shark Bay and Shark Bay Marine Park.	No	Yes
WCD2019/014	Nanda People Part B, Malgana 2 and Malgana 3	Malgana Aboriginal Corporation and Nanda Aboriginal Corporation	In this shared determination area, native title is held by both the Malgana people and the Nanda people. The area is located approximately 250 km north of Geraldton, south of Shark Bay and west of Toolonga Nature Reserve.	No	Yes
WCD2018/011	Nanda People and Nanda #2	Nanda Aboriginal Corporation	The determination area covers approximately 17,000 km^2, including the town of Kalbarri, Kalbarri National Park, the Zuytdorp Nature Reserve and the Toolonga Nature Reserve.	No	Yes

Figure 3-42: Native Title Determination Areas in the vicinity of the Operational Area



3.7.4 Indigenous Protected Areas

Indigenous Protected Areas (IPAs) are areas of land and sea managed by Indigenous groups as protected areas for biodiversity conservation through voluntary agreements with the Australian Government. IPAs are an essential component of Australia's National Reserve System, which is the network of formally recognised parks, reserves and protected areas across Australia. The Nyangumarta Warrarn IPA is located within the EMBA, as discussed in Section 3.7.4.1. No IPAs are located in the Hydrocarbon Area or Operational Area.

3.7.4.1 Nyangumarta Warrarn IPA

The Nyangumarta Warrarn IPA is comprised of four areas totalling approximately 28,675 km^2, including parts of The Great Sandy Desert, Walyarta Conservation Reserve, Kujungurru Warrarn Conservation Reserve Area and the Eighty Mile Beach Marine Park Intertidal Area. The traditional owners of the designated IPA self-identify as and are identified by other Pilbara Aboriginal First Nations people as Nyangumarta people. Nyangumarta people are the native title holders of the land and waters.

Ecological values in the IPA include a complex wetland system associated with Mandora Marsh, known to Nyangumarta people as Nyamaring. Walyarta (or Salt Creek). The Mandora Marsh area holds the most inland distribution of mangroves in Australia and the mound springs associated with Mandora Marsh area, such as Yalayala (Eil Eil), are recognised as important bird nesting sites (NWAC and YMAC, 2015).

3.7.4.2 Future Sea Country IPAs

In 2021-2022 the Australian Government, through DCCEEW, announced an expansion to the IPA program to include coastal and marine areas (the Sea Country IPA Program). Through the Sea Country IPA Program, the Australian Government is seeking to strengthen the conservation and protection of the marine and coastal environments, while creating employment and economic opportunities for Indigenous People (DCCEEW, 2024a).

Two of the 10 future Sea Country IPA consultation projects announced in 2022 are located within or adjacent to the EMBA (DCCEEW, 2022a):

Tukujana pa Karajarri Kura Jurrar, Western Australia (Karajarri Traditional Lands Association)

The IPA consultation area expands the existing Karajarri IPA offshore along the south-west Kimberley coast, connecting the Roebuck Bay and 80 Mile Beach Ramsar sites. The area includes a network of coastal habitats such as intertidal and subtidal reefs, mangroves, lagoons and tidal creeks. Key ecological sensitivities in the area include dugongs, shorebirds and finfish. The area is regarded as a dugong sanctuary and provides habitat for an estimated 450,000 birds. The project includes implementation of a mangrove protection program, reef health program and cultural revitalisation program (DCCEEW, 2022a).

Yamatji Sea Connection, Western Australia (Bundi Yamatji Aboriginal Corporation)

The IPA consultation area is off the coast of Geraldton including the Abrolhos Islands and Hutt Lagoon System, which are ecologically significant to several species of birds and turtles as well as the Australian sea lion. An objective of the IPA is to establish a turtle monitoring and protection

program, biosecurity monitoring program at Abrolhos and Geraldton Port and conduct climate change research on potential impacts to Abrolhos marine and terrestrial ecosystems and coastal wetlands (DCCEEW, 2022a).

3.7.5 Aboriginal Cultural Heritage

The *WA Aboriginal Heritage Act 1972* was amended and reinstated in 2023. The Act aims to ensure recognition, protection and preservation to all Aboriginal cultural heritage (including sites and objects) within WA. It is an offence to excavate, destroy, damage, conceal or in any way alter Aboriginal heritage under s.17 of the Act.

The WA Aboriginal Cultural Heritage Inquiry System (ACHIS) was searched for the Operational Area, and the EMBA. There are no registered Aboriginal Cultural Heritage sites within the Operational Area. There are 283 registered sites present within the EMBA and 69 sites within the Hydrocarbon Area. However, none of these sites will be disturbed by planned activities. The closest sites to the Operational Area are on Rosemary Island, approximately 35 km away. VOGA have consulted with First Nations groups within the EMBA and no feedback or concerns about impacts to specific Aboriginal sites were raised. The full results of the EMBA search is presented in Appendix D.

3.7.6 Cultural Values and Sensitivities

3.7.6.1 Sea Country

'Country' is the term often used by First Nations people to describe the lands, waterways, and seas to which they are connected. The term contains complex ideas about law, place, custom, language, spiritual belief, cultural practice, material sustenance, family, and identity (AIATSIS, 2022). 'Sea Country' (also known as Saltwater Country) extends into the Operational Area, Hydrocarbon Area and EMBA.

Country is a cultural landscape which includes both tangible values (i.e. cultural heritage sites) and intangible values (i.e. creation stories and cultural practices). First Nations cultural concepts are directly connected with Country. Country describes all aspects of place, environment, spirituality, law and identity. Values of Country differ between First Nations groups, and not all First Nations groups and communities in Australia hold the same belief systems or spirituality. Differences can sometimes be attributed to aspects of post-colonialism such as dispossession, genocide and restrictions on cultural practices.

Due to the varied cultures and histories of First Nations groups across Australia and various degrees of dispossession, removal from country, loss of connection and continuation of culture, the responses of First Nations communities to caring for Country can vary widely. As a result, a varied approach to managing cultural (both tangible and intangible) values is required.

A 'cultural landscape' refers to pre-colonial and contemporary interactions between humans and the physical environment including non-human animals, plants, physical structures, ancestors, song lines, trade routes and other significant cultural connections to Country. Cultural landscapes are reflections of how First Nations people engage with Country, intrinsically connecting the past and the present to people, stories and history.

Sea Country is Country that extends into the ocean. Smyth and Isherwood (2016) describe Sea Country as all estuaries, beaches, bays, and marine areas collectively, within a traditional estate. Sea Country contains evidence of the ancient mystical events by which all geographic features, animals, plants and people were created. Sea Country contains sacred sites and tracks (or 'Songlines') along which mythological beings travelled during the creation period (or 'Dreamtime') (Smyth and Isherwood, 2016). The sea, like the land, is integral to the identity of First Nations groups. Connection to Sea Country is accompanied by a complexity of cultural rights and responsibilities. Coastal areas traditionally were amongst the most densely populated areas due to the abundance of resources available. Formal recognition of Sea Country rights is significantly slower compared to land rights. This could be for a range of reasons including conflicting perspectives and opinions on traditional custodianship of land and how far it extends (Smyth and Isherwood, 2016).

During consultation with First Nations groups, cultural values were identified (Table 3-16). VOGA will continue to consult with First Nations groups to further identify potential cultural values and interests within and surrounding the EMBA, as described in Section 9.4.1.

Table 3-16: Feedback received via consultation to inform existing environment description

Relevant First Nation Group/ individuals	Description of value/interest	Potential for overlap	
		Operational Area	EMBA
Karajarri Traditional Lands Association	Interest: Seismic activities and impacts to the seabed.	No	Yes
	Interest: Oil spill and emergency response, and impacts of ocean currents.	No	Yes
	Interest: Training for ranger groups.	No	Yes
Kariyarra Aboriginal Corporation	Value: On Country access – visiting offshore 'Kariyarra Island' at low tide. Has cultural significance to the Kariyarra people for intergenerational knowledge transfer and is a place of cultural importance.	No	Yes
	Value: Cultural obligations to care for Kariyarra Country.	No	Yes
	Feature: Tangible cultural heritage (sites) with engravings on the coast, considered fragile.	No	Yes
	Interest: Co-protecting Kariyarra country in the event of a spill. A ranger program is being developed to address potential environmental impacts of offshore operations.	No	Yes
Nanda Aboriginal Corporation	Interest: Research in whales, specifically migration and acoustics.	No	Yes
Ngarluma Aboriginal Corporation	Value: Strong connection to tangible cultural heritage, system, and cultural protocols. Cultural connection to the World Heritage-listed Dampier Archipelago, including Whim Creek and Delambre Island.	No	Yes
	Value: Importance of local wildlife, primarily on sea turtle nesting, marine migration, and culturally significant areas, including particular importance of the Maitland River.	No	Yes

Relevant First Nation Group/ individuals	Description of value/interest	Potential for overlap	
		Operational Area	EMBA
	Interest: The Sea Rangers program has been developed, and there is an interest in upskilling for a potential offshore impact event.	No	Yes
Wanparta Aboriginal Corporation	Interest: Particular interest in potential noise impacts on migrating whales and turtle migration patterns.	No	Yes
	Value: Cultural connection to the marine environment and fauna, with Stingrays being a significant animal totem to the group. Additional importance is placed on sharks, octopus, fish and birds.	No	Yes
	Feature: Cultural heritage (sites) with the presence of Songlines between three islands within the native title area, which were once accessible on foot.	No	Yes
	Interest: Species of bird of high importance and was impacted on the islands due to a recent cyclone.	No	No
	Value: Detailed lore, culture and customs with a strong spiritual connection to the sea country. Protection and management of marine life are significant to the group.	No	Yes
Murujuga Aboriginal Corporation	Feature: Recent World Heritage Listing of importance to the group with cultural heritage sites on the coastline.	No	Yes

3.7.6.2 Country in the North-West Marine Region

Northern Australia was one of the first areas of Indigenous occupation in Australia. Archaeologists have concluded that Indigenous people arrived in the north-west at least 50,000 years ago when sea level was at least 100 m lower than present (Smyth, 2007). As a result, First Nations communities in the NWMR have maintained special links with Sea Country for many thousands of years through occupation, resource utilisation and other cultural practices (including stories, dance, management practices and ceremonies). Pre-colonial use of Australia's oceans by coastal First Nations groups varied over time and between regions. Patterns of use at the time of colonisation included hunting, fishing and gathering as well as extended sea voyages by canoe to exploit resources and manage clan Sea Country, sometimes out of sight of the mainland (Smyth, 2007).

First Nations people of the NWMR continue to assert inherited rights and responsibilities over sea country. It is understood that spiritual corridors and Songlines extend from terrestrial areas into nearshore and offshore waters, including a number of marine animals as totems (DNP, 2018).

Indigenous communities own the majority of land adjacent to the NWMR (DEWHA, 2008a). Native title determinations in the NWMR recognise in law that native title exists over Sea Country and preserve continuing rights to access sea country to hunt, fish, gather and use the resources of the waters for personal, domestic, communal, cultural and spiritual needs. Traditional Indonesian fishers have also visited and used the northern coast of Australia and its

islands and reefs since at least the early eighteenth century. Evidence of this (i.e. grave sites) is found within the Ashmore Reef Marine Park (DNP, 2018).

Indigenous people in the NWMR have continued their traditions of caring for country in a contemporary manner. Contemporary industry activities apply pressure to Sea Country values, including (from Smyth, 2007):

- The transit and use of Commonwealth waters by dugongs, turtles and fish important to Aboriginal people
- The transit and control of illegal foreign fishers
- The transit and control of foreign shipping
- The transit and control of unauthorised immigrants
- The management of oil and gas exploration and extraction
- Cultural stories, sites and Songlines/Dreaming lines that may extend into Commonwealth waters
- Knowledge that the flooded countries of ancestors lie beneath Commonwealth waters
- Aboriginal participation in commercial fishing
- Aboriginal involvement in tourism and charter fishing enterprises.

3.7.6.3 Country in the South-west Marine Region

First Nations people of the South-west Marine Region (SWMR) consider their Sea Country to encompass waters from the coastline to the horizon and sometimes beyond (SWMR Profile). The relationship between south-west First Nations groups and the sea is underpinned by custodial rights and responsibilities which have existed for thousands of years, before rising sea levels created the current marine environments. It is understood that spiritual corridors extend from terrestrial habitats into nearshore and offshore waters, including many marine animals as totems. Important activities related to Sea Country in this region include fishing, hunting and maintaining maritime culture and heritage through ritual, stories and traditional knowledge (SWMR Profile).

Colonisation in the SWMR removed people from their lands and aimed to destroy languages, religious beliefs and cultural knowledge. Older people sometimes managed to preserve a wealth of knowledge in silence which is now being shared with younger generations. Some of this knowledge re-emerges as people visit sites and features in the landscape which rekindles links with Country. Today, caring for Country continues to be of major importance to Indigenous people based on principles of respect, obligation and reciprocity derived from laws and customs which have been handed down for generations (AIATSIS, 2006).

Indigenous people in the SWMR have continued their traditions of caring for country in a contemporary manner. Major concerns expressed by Traditional Owners regarding contemporary pressures along the coast include (from Stewart, 2003 as cited in AIATSIS, 2006):

- The potential effect of overuse of Sea Country resources due to overpopulation
- Trampling and disturbance of habitats
- Increased boat activity

- Loss of biodiversity, hatchery and breeding areas
- Destruction of Aboriginal sites
- Depletion of reef species within the intertidal zone.

3.7.6.4 Marine Parks

Cultural values within Australian Marine Parks are broadly defined as living and cultural heritage recognising Indigenous beliefs, practices and obligations for country, places of cultural significance and cultural heritage sites. Table 3-17 lists cultural heritage values identified within State and Commonwealth marine parks within the Operational Area, Hydrocarbon Area and EMBA. Cultural heritage values are from the Australian Marine Parks North-west Network Management Plan and Australian Marine Parks South-west Network Management Plan (DNP, 2018a; DNP, 2018b) unless otherwise stated.

Table 3-17: State and Commonwealth Marine Protected Areas within the EMBA and Identified Cultural Heritage Values

Marine Park type	Project Areas			Identified Cultural Heritage Values (from relevant marine park network management plans, or other sources as cited)
	Operational Area	Hydrocarbon Area	EMBA	
Abrolhos Islands				
Habitat Protection Zone (IUCN IV) Multiple Use Zone (IUCN VI) Fish Habitat Protection Area	-	✓	✓	• Finfish stocks, cray and squid stocks, marine breeding grounds, coral reefs. • Bird areas, protect nesting areas of sea birds; Seal colonies; Mangroves (AgDots, 2022) • The Nanda and Naaguja People have responsibilities for sea country in the Marine Park. • Traditional Owners have strong stories that connect ocean and land. Artefacts from ancestors are abundant on islands in the adjacent state marine park. • The Yamatji Marlpa Aboriginal Corporation is the Native Title Representative Body for the Yamatji region.
Argo-Rowley Terrace				
Multiple Use Zone (IUCN VI) National Park Zone (IUCN II) Special Purpose Zone (Trawl) (IUCN VI)	-	-	✓	Not recorded.
Carnarvon Canyon				
Habitat Protection Zone (IUCN IV)	-	-	✓	Not recorded.

Marine Park type	Project Areas			Identified Cultural Heritage Values (from relevant marine park network management plans, or other sources as cited)
	Operational Area	Hydrocarbon Area	EMBA	
Dampier				
Habitat Protection Zone (IUCN IV) Multiple Use Zone (IUCN VI)	-	✓	✓	• The Ngarluma, Yindjibarndi, Yaburara, and Mardudhunera people have responsibilities for sea country in the Marine Park. • The Native Title holders for these people are represented by the Ngarluma Aboriginal Corporation and Yindjibarndi Aboriginal Corporation. • These Prescribed Body Corporates represent Traditional Owners with native title over coastal area adjacent to the Marine Park are the points of contact for their respective areas of responsibility for sea country in the Marine Park. • Murujuga World Heritage Area (UNESCO, 2025) and National Park is Western Australia's 100th national park and the first to be co-managed by Traditional Custodians and the WA Department of Biodiversity, Conservation and Attractions (DBCA). Murujuga Aboriginal Corporation holds the freehold title to Murujuga National Park which overlaps the EMBA. Murujuga Aboriginal Corporation is made up of members from five traditional custodial groups: the Ngarluma, Mardudhunera, Yaburara, Yindjibarndi, and Wong-Goo-Tt-Oo peoples. DBCA staff and Murujuga Aboriginal Corporation National Park Rangers work closely together to jointly manage Murujuga National Park.
Eighty Mile Beach				
Multiple Use Zone (IUCN VI)	-	✓	✓	• The Sea Country of the Nyangumarta, Karajarri and Ngarla people extends into Eighty Mile Beach Marine Park. Sea country is culturally significant and important to their identity. • There is an unbroken, deep spiritual connection to Sea Country, with traditional practices continuing today. • Staple foods of living cultural value for the Nyangumarta, Karajarri and Ngarla people include: – Saltwater fish – Turtles – Dugong – Crabs – Oysters.

Marine Park type	Project Areas			Identified Cultural Heritage Values (from relevant marine park network management plans, or other sources as cited)
	Operational Area	Hydrocarbon Area	EMBA	
				• Access to sea country by families is important for cultural traditions, livelihoods and future socio-economic development opportunities. • The native title holders for the Nyangumarta, Karajarri and Ngarla people are represented by the Karajarri Aboriginal Corporation, Nyangumarta Karajarri Aboriginal Corporation, Nyangumarta Warrarn Aboriginal Corporation, and Wanparta Aboriginal Corporation. • These Prescribed Body Corporates represent Traditional Owners with native title over coastal area adjacent to the Marine Park and are the points of contact for their respective areas of responsibility for sea country in the Marine Park. The Kimberley Land Council and the Yamatji Marlpa Aboriginal Corporation are the Native Title Representative Bodies for Kimberley and Pilbara regions.
Marine Park	-	-	✓	• Traditional owners maintain connection to their traditional coastal and sea country through identity and place, family networks, spiritual practice and resource gathering. • Native title rights and interests have been recognised over the intertidal areas of the marine park. • Four special purpose zones for cultural heritage exist within the park: Jangyjartiny, Paruwuturr, Pilyarikarra and Waru. Three of these are inhabited by pulany (snakes) and one is associated with the creation story of both Nyangumarta and Karajarri country (DPAW, 2014).
Gascoyne				
Habitat Protection Zone (IUCN IV) Multiple Use Zone (IUCN VI) National Park Zone (IUCN II)	-	✓	✓	Not recorded.
Mermaid Reef				
National Park Zone (IUCN II)	-	-	✓	Not recorded.

Marine Park type	Project Areas			Identified Cultural Heritage Values (from relevant marine park network management plans, or other sources as cited)
	Operational Area	Hydrocarbon Area	EMBA	
Montebello				
Multiple Use Zone (IUCN VI)	-	✓	✓	Not recorded.
Montebello Islands and Barrow Islands (Jointly Managed)				
Marine Park Conservation Park Marine Management Area	-	✓	✓	Not recorded.
Ningaloo AMP and Ningaloo Murion Islands Marine Management area (Jointly Managed)				
Recreational Use Zone (IUCN IV) National Park Zone (IUCN II) Marine Management Area Marine Park	-	✓	✓	• Ningaloo Reef and the adjacent foreshore have a long history of occupancy by Aboriginal communities. The foreshore and hinterland of North-West Cape contain numerous Aboriginal sites such as burial grounds, middens and fish traps that provide a historical account of the early habitation of the area and a tangible part of the culture of local Aboriginal groups. • The earliest Aboriginal groups to inhabit the peninsula were the Jinigudira and the Baiyungu people. The Jinigudira inhabited most of the land adjacent to the reef and northern cape, while the Baiyungu inhabited the southern areas of foreshore adjacent to the reef. The archaeological record of the Cape Range Peninsula is significant in that it provides the earliest confirmed record of Pleistocene marine resource use in Australia. Aboriginal habitation of the North West Cape and Exmouth is thought to have commenced at least 32,000 years (with some reports of 38,000 years before present and continues up to the present (Western Australian Planning Commission 2004 as cited in CALM and MPRA, 2005). • Although the majority of local Aboriginal people live in towns such as Carnarvon and Onslow, individuals and families retain strong ties to particular sites. The Jinigudira and the Baiyungu still maintain and associate with the North West Cape and are recognised as the traditional owners of these lands (Gnulli Park Council, pers. comm.). Cardabia pastoral station surrounding Coral Bay is owned and managed by the Baiyungu community. Despite disruptions to traditional life, Aboriginal people seek to retain social, religious and personal bonds with their traditional lands. Current Aboriginal usage of

Marine Park type	Project Areas			Identified Cultural Heritage Values (from relevant marine park network management plans, or other sources as cited)
	Operational Area	Hydrocarbon Area	EMBA	
				the area includes camping and fishing, as well as limited hunting of turtle and dugong (CALM and MPRA, 2005).
Pilbara Islands Nature Reserve (Great Sandy Island, Little Rocky Island, Thevenard Island, Unnamed WA51046)				
Nature Reserve	-	✓	✓	Not recorded.
Rowley Shoals				
Marine Park	-	-	✓	Not recorded.
Shark Bay				
Multiple Use Zone (IUCN VI)	-	✓	✓	The Gnulli and Malgana people have responsibilities for Sea Country in the Marine Park. The Yamatji Marlpa Aboriginal Corporation is the Native Title Representative Body for the Yamatji region. Aboriginal occupation has been dated to 30,000 years ago and there is evidence of reliance on the marine resources at Shark Bay in more recent sites investigated. Aboriginal sites including open shell middens, quarries, rock shelters, artefact shelters, burials and stone arrangements have been recorded at Shark Bay. Most of these sites directly overlook the shoreline or are very close to it. Sustainable hunting of green turtles and dugongs is an ongoing management activity (DCLM, 1996).

Section 4 Risk Assessment Methodology

4.1 Overview

Environmental risk assessment is a key component of the environmental risk management process. Environmental risk is assessed by determining the consequence (impact) of an environmental hazard and the likelihood that the consequence will occur, taking consideration of both existing and additional proposed control measures.

Key terminology used in this section of the EP includes:

- **Acceptable**: a tolerable level of impact or risk (either quantitative or qualitative) when assessed in relation to the principles of Ecologically Sustainable Development (ESD), internal and external contextual consideration and other relevant requirements (Section 4.9).
- **Activity**: An activity is a 'Petroleum Activity' as defined within Section 5 of the OPGGS(E)R. Specifically, in the context of this EP, 'Activity' relates to an exploration drilling activity.
- **ALARP**: A level of risk that is tolerable, where the cost of reducing it further (e.g. financial, time, effort) is grossly disproportionate to any risk reduction gained (as per VOGA Risk Management Manual VOG-2000-MN-0001). The methodology for demonstrating ALARP is described in further detail below (Section 4.8).
- **Catastrophic Environmental Event (CEE)**: any event which has an environmental impact ranked as "4 – Catastrophic" on the VOGA risk matrix (Section 4.7).
- **Cause**: The cause of a particular environmental impact. The cause may be an 'activity', or the cause could be an unplanned event, e.g. "vessel collision with facility".
- **Consequence ranking**: A measure of the severity of the environmental impact in accordance with the VOGA risk matrix (Section 4.7).
- **Control measures**: A means of reducing environmental risk by prevention, frequency reduction, or impact reduction. Control measures take many forms including systems, procedures, people and equipment.
- **Critical Control**: a control that has a key role in preventing, detecting, controlling or mitigating a CEE (as assessed on the VOGA risk matrix [Section 4.7]).
- **Environment**: is and includes the social, economic and cultural features of:
  - ecosystems and their constituent parts, including people and communities
  - environmental assets such as:
    - natural and physical resources
    - the qualities and characteristics of locations, places and areas
    - the heritage value of places.
- **Environmental hazard**: A situation with the potential for causing an environmental impact.
- **Environmental impact**: Any change to the environment arising from an environmental hazard.

- **Likelihood ranking**: A measure of the chance of an environmental impact occurring (expressed as chance, probability or frequency) in accordance with the VOGA risk matrix (Section 4.7).
- **Measurement criteria**: Tangible indicators, quantifiable where possible, that will be used to evaluate the achievement (or otherwise) of environmental performance standards and objectives.
- **Mitigation controls**: Controls which will be utilised in the event that the environmental hazard, requires steps to be taken to return the activity and/or the environment to an acceptable state, i.e. consistent with the environmental objective.
- **Performance outcome**: A measurable level of performance required for the management of environmental aspects of the activity to ensure that environmental impacts and risks of the activity will be of an acceptable level.
- **Performance standard**: A statement of the performance required of a control.
- **Preventive controls**: Controls which will prevent an environmental impact.
- **Residual risk**: The residual risk rating considering the effectiveness and availability of controls (existing and additional).
- **Risk**: A change to the environment that may occur as a result of an unplanned event.

4.2 Demonstrating ALARP of Impact and Risk

4.2.1 Demonstration of ALARP

Demonstrating ALARP has been undertaken in accordance with VOGA's Risk Management Manual [VOG-2000-MN-0001] and NOPSEMA's ALARP Guidance Note [N-04300-GN0166] (2022) [with the key principles of this Guidance Note (Health and Safety) also applying to Environmental Management]. Demonstrating that risks levels are ALARP is a two-step process. Firstly, residual risk levels must be tolerable, that is not within the "High" or "Extreme" risk area of the VOGA Risk Matrix as per Table 4-4. Secondly, once deemed tolerable further risk reduction measures must be identified and assessed for implementation as described below.

Following the identification of standard industry 'good practice' risk mitigation controls and recovery measures, VOGA reviews the residual risk and assesses whether there are any further measures required to reduce the residual risk to ALARP. Risks are considered to have been reduced to ALARP if the risks are within the tolerable region of the VOGA Risk Matrix and have been subject to a detailed assessment process that has concluded that there are no additional reasonably practicable measures that can be implemented to further reduce the level of risk.

When deciding whether risks are managed to ALARP, the following items are considered:

- Duration and regularity of operations
- Risk
- Layers of protection
- Feasibility of additional controls or alternative arrangements
- Practicality of additional controls or alternative arrangements

- Cost of additional controls or alternative arrangements
- Effectiveness of additional controls or alternative arrangements
- Impact on risks from additional controls or alternative arrangements
- Lessons learnt from past campaigns and industry.

This decision is valid where:

- All environmental hazards have been identified and assessed
- Risk levels have been evaluated
- Residual risk levels are tolerable, compliant and ALARP.

EPSs have been defined to ensure that the risks are reduced to ALARP on an ongoing basis. The VOGA risk matrix defines an upper threshold above which no risk is tolerable. Below this threshold is the ALARP region, where risks should be further reduced until the cost of any additional action outweighs the incremental benefit gained.

4.2.2 Concept Evaluation ALARP Demonstration

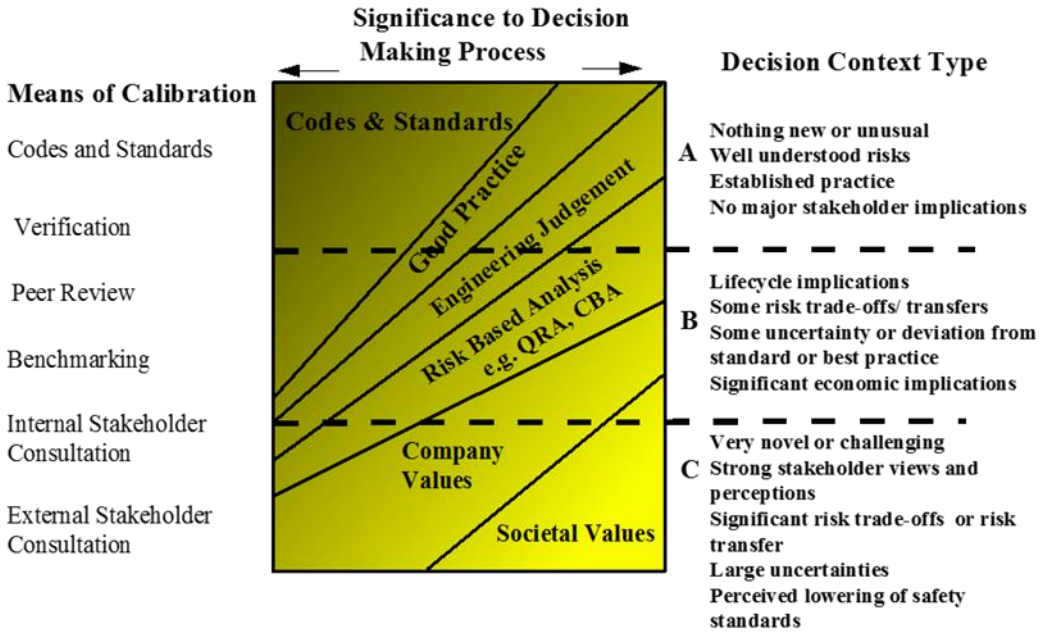
For evaluation of concepts a specific ALARP Demonstration Worksheet is completed in accordance with the processes defined in VOGA's Risk Management Manual [VOG-2000-MN-0001]. For concept evaluations, demonstration of ALARP contains elements of the following process:

- Identification and consideration of a range of potential measures for further risk reduction
- Systematic analysis of each of the identified risk reduction measures and a view formed on the HSE benefit associated with each of them
- Evaluation of the reasonable practicability of the identified measures
- The implementation (or planned implementation) of the identified risk reduction measures
- Recording of the process and results.

The United Kingdom Offshore Operators Association (UKOOA) has produced guidelines for assisting with the ALARP decision-making process and for recording and demonstrating the robustness of the decision as depicted in Figure 4-1. These are regarded as good practice internationally and have been adopted globally as the standard guidance for ALARP decision making.

The UKOOA guidelines describe a framework that is intended to help decision-makers identify the various decision factors and establish a basis for the decision based on these. The decision framework assesses the significance to the decision process of codes and standards, good practice, engineering judgement, risk analysis, cost benefit analysis, and company and societal values. They aim to encourage the development of transparent decision-making processes.

Figure 4-1: UKOOA decision support framework



The first step in the decision-making process is to establish the decision context. This is done by assigning a decision context type (A-C), based on the categories and prompts detailed in Table 4-1.

Table 4-1: ALARP decision context type

Decision context	Description
A	Nothing new or unusual Well understood risks Established practice No major stakeholder implications
B	Lifecycle implications Some risk trade-offs/transfers Some uncertainty or deviation from standard or best practice Significant economic implications
C	Very novel or challenging Strong stakeholder views and perceptions Significant risk trade-offs or risk transfer Large uncertainties Perceived lowering of safety standards

The ALARP template provides questions around the decision context and prompts discussion to determine the appropriate context type.

Once the decision context has been established, Table 4-2 is then consulted to determine an appropriate method of decision making. For example, a design which involves nothing new or unusual, has well understood risks and no major uncertainties or shareholder implications, would be assigned a decision context in the middle of Type A as shown by the band in Table 4-1.

Reading across this band indicates the relative importance of each of the decision-making criteria; that is, the decision should be primarily based on the requirements of codes and standards, then engineering judgement and finally good practice. Quantitative Risk Assessment (QRA) should not be allowed to have a great influence on the decision. Consulting the codes and standards provides an appropriate means to calibrate the decision.

However, if the costs associated with the problem were considerable, or there were significant risk uncertainties, this would push the context towards Type B. In this case, some use of QRA and consideration of the company values would be appropriate.

Table 4-2 provides further explanation of each of the decision-making criteria.

Table 4-2: Decision criteria definitions

Decision criteria	Definition
Codes and Standards	Decision basis is to follow the requirements of relevant codes and standards. Codes and standards embody the lessons learnt over past years, and for well understood hazards and situations often provide an appropriate solution.
Good Practice	Decision basis is to follow what is generally accepted as current standard or good/best practice. Good practice embodies both the requirements of codes, etc. and other good engineering, analysis and management practices for common situations. Good practice may include solutions that have not yet found their way into codes and standards. What is good practice may differ from situation to situation. Care should be taken to benchmark against the relevant good practice or emerging practice.
Engineering Judgement	Decision basis is to follow what sound engineering judgement indicates is the best solution. This would be expected to include a recognition of what is good/best emerging practice, and an understanding and application of sound engineering and scientific principles and methods. It could include: engineering analysis, consequence modelling, deterministic cases for hazard management as well as competent judgment and interpretation of these and other information.
Risk Based Analysis (QRA, cost benefit analysis (CBA), etc.)	Decision basis is to make use of the results of probabilistic analyses such as QRA, reliability analysis and CBA to support the decision-making process. The assessment could be qualitative or quantitative. Uncertainties and the resolution of the analysis vs the needs of the decision will be key issues to address.
Company Values	Decision basis should take account of the views, concerns and perception of the stakeholders directly affected by the decision/option and the values of the company in terms of its safety commitment, image, etc.
Societal Values	Decision basis should take account of the views, concerns and perceptions of all the relevant stakeholders, including society at large.

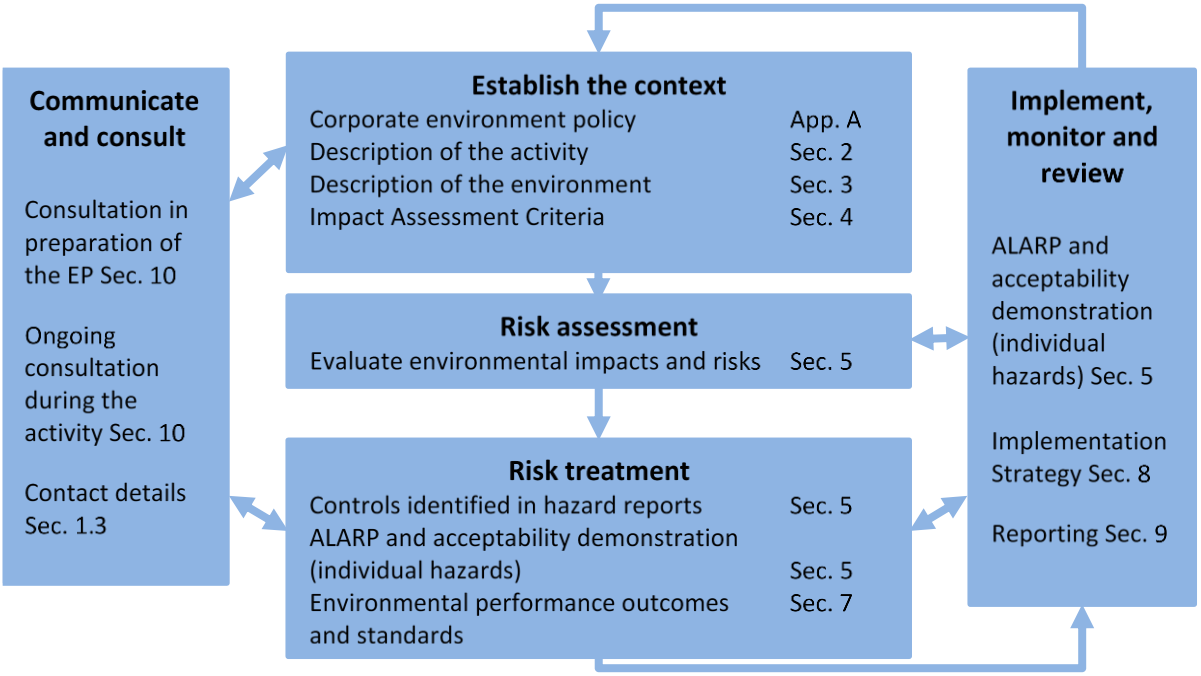
The ALARP Demonstration Worksheet provides documentary evidence that the above process has been followed and requires a recommendation of the proposed solution that best meets the appropriate criteria.

4.3 Framework

The environmental risk assessment was undertaken in accordance with VOGA Risk Management Manual [VOG-2000-MN-0001] and in line with the requirements of the OPGGS(E)R. The framework adopted by VOGA in compiling this EP is consistent with the methodology described

in AS/NZS ISO 31000 and NOPSEMA Environment plan content requirement Guidance Note [N04750-GN1344] (2020). Figure 4-2 depicts this methodology with reference to relevant sections of this EP where the requirements are addressed.

Figure 4-2: Content Requirements of this EP (within the Framework Outlined in AS/NZ ISO 31000)



The scope of activities covered by this EP was confirmed in terms of its timing(s), extent, and the nature of the activities included within it. This scope is reflected in the activities described in Section 1.4.

Potential environmental hazards associated with activities and unplanned events were identified, and impacts determined in a qualitative manner in an environmental hazard review workshop. Existing controls were identified in the same workshop. Each hazard employs a hierarchy of controls which relies on the following (in order of preference):

- Elimination: Refers to the elimination of a hazard, for example the use of a renewable energy source eliminates the emissions associated with power generation.
- Substitution: This refers to scenarios where an alternative arrangement is used to reduce the risk levels. For example, using a lower emission fuel type.
- Prevention: removing the causes of a particular impact or decrease their likelihood. As an example, a simpler plant with fewer leak points.
- Reduction: Limits the scale and consequence of a particular impact. For example, changes to process systems to reduce the size of hazardous inventories.
- Mitigation: Controls in place to respond to an incident, such as oil spill contingency planning.

In the case of complex or high hazard risks, environmental impact modelling was carried out to ensure that the impacts were thoroughly understood.

The severity, frequency, and subsequently the initial risk ranking was allocated to each hazard in accordance with the VOGA Risk Management Manual [VOG-2000-MN-0001]. The risk rankings were reviewed, and additional controls were considered to reduce the residual risk to ALARP and acceptable levels.

The Environmental Performance Outcomes (EPOs), Environmental Performance Standards (EPSs) and measurement criteria associated with the controls were developed in a series of performance standard workshops. The residual risk score for each environmental hazard was assigned considering the risk reduction from both the existing and any additional controls. The implementation strategy (0) describes how the additional controls will be implemented.

4.4 Impact Assessment

An assessment of impact for each identified hazard was conducted by:

- Defining impact assessment criteria
- Quantifying magnitude of the stressor, including where applicable, quantity, concentration of contaminant and level of disturbance
- Consideration of timing and duration of the impact and other factors affecting the impact and risk (depth, temperature, tides, etc.)
- Consideration of environmental features affected either directly or indirectly
- Evaluation of the acceptability of the impact and risk.

4.4.1 Cumulative Impacts

In the context of offshore petroleum activities, cumulative environmental impacts are defined by NOPSEMA as successive, additive, or synergistic impacts of collectively significant activities or projects with material impacts on the environment that have the potential to accumulate over temporal and spatial scales (NOPSEMA, 2024a).

VOGA has assessed the cumulative impacts of the exploration drilling activities in relation to other current or foreseeable activities, including other petroleum and greenhouse gas activities, that could realistically result in overlapping temporal and spatial extents. Assessment of these impacts from concurrent or parallel activities has been included in Section 6.

4.5 Determination of Likelihood

The VOGA Environmental Risk Matrix (Table 4-3) provides for the likelihood of an impact (consequence) occurring to be determined on the basis of either chance, probability or frequency.

For higher-order risks, the probability of the impact occurring should be evaluated (where possible) on industry data of previous events that have caused impacts to occur. Where statistical industry data is not available, the frequency of events should be determined via other means such as corporate knowledge.

For lower-order risks, or where historical industry information may be unavailable, either 'frequency' or chance' may be used to determine likelihood of the impact occurring.

The determination of likelihood should only be evaluated using a single evaluation technique i.e. either probability, frequency or chance in decreasing order of precedence.

4.6 VOGA Risk Ranking

The risk ranking was carried out in accordance with VOGA Risk Management Manual [VOG-2000-MN-0001] and utilised through to Section 5.

Table 4-3 is the VOGA corporate risk matrix representing the environmental consequence evaluation in relation to the frequency rating of the occurrence of the environmental hazard, assuming identified controls are in place. The residual risk level is used to establish the actions required to manage potential impacts and risks to ALARP and acceptable levels, and provides environmental consequence definitions in the context of the nature of receptors potentially impacted by the petroleum activity as described in Section 2 of this EP.

The risk action table defines risk levels and the actions required to reduce the risk (Table 4-4). VOGA considers residual environmental risks to be acceptable when at a Residual Risk (RR) level of RRIV (Low) or RRIII (Medium). Table 4-5 details the criteria for socio-economic impacts.

Table 4-3: VOGA environmental risk matrix

								LIKELIHOOD				
							Chance	Rare	Unlikely	Possible	Likely	Almost Certain
							Probability	1 in 10 000 - 100,000	1 in 1000 - 10,000	1 in 100 - 1000	1 in 10 - 100	1 in 1-10
							Frequency	Not known to have occurred, but believed to be a credible scenario	Has occurred within our own industry	Has occurred within Vermilion, or has occurred multiple times per year within our own industry	Has occurred several times within Vermilion	Has occurred typically once or more per year within Vermilion
	People	Environment	Business Loss ($ CAD)	Regulatory	Reputation			A	B	C	D	E
POTENTIAL CONSEQUENCE	Multiple fatalities	Irreversible effects on habitat, ecological communities, land, air or water Persistent reduction in sensitive ecosystem function (extends beyond area abandonment timeframe) Effects extend beyond regional scale and/or operating area/district	>$100MM	Regulator permanently withdraws authority to operate Company officials prosecuted	National or international impact- widespread concern with extensive media coverage, prolonged operating region attention Stakeholder concerns force national / regional shutdown of operations or prevention of future operations	5	Catastrophic					
	Fatality	Persistent but reversible, long-term (>10 years) effects on habitat, ecological communities, land, air or water Effects are widespread within region and/or specific operating area	>$10MM – 100MM	Regulatory and/or legal action taken Specific asset shut in for unknown duration during proceedings	National or international impact- widespread concern with extensive media coverage, prolonged operating region attention Stakeholder concerns lead to regional interruption of operations	4	Major					
	Lost Time Incident	Reversible, medium-term (5-10 years) effects on habitat, ecological communities, land, air or water Effects extend into the immediate surroundings of the operating area/lease and/or localized off-lease	>$1MM –10MM	Regulator temporarily withdraws authority to operate on a specific asset	Local to regional impact – prolonged local to regional area negative attention Stakeholder concerns lead to local interruption of operations	3	Moderate					
	Restricted Work Incident	Reversible, short term (1-5 years) effects on habitat, ecological communities, land, air or water Effect within operating area/lease boundaries or localized off-lease	$250K - 1MM	Regulatory attention resulting in an administrative response, directive, warning, or order Could result in a regulatory consequence	Community/local impact – brief community/local area negative attention Stakeholders have concerns that can be addressed through normal business	2	Minor					
	≤ Medical Treatment	Reversible, short term (<1 year) effects on habitat, ecological communities, land, air or water Effect within operating area and/or contained on-lease	<$250K	Regulatory Notice requiring action No regulatory consequence if addressed	On site communications, limited public awareness, single stakeholder concern	1	Incidental					

Table 4-4: Risk action table

Risk Level (includes inherent risk in the event no safeguards are available)	Inherent Risk Action to Reduce Risk to an Acceptable Level	Residual Risk Action to Reduce Risk to an Acceptable Level
RRI or Extreme	Immediate implementation of temporary safeguard. Stop activities until risk controls/safeguards that will reduce the risk are implemented Implement permanent safeguard to reduce risk to acceptable level.	Review Environment Acceptability criteria (Section 4.7)
RRII or High	Immediate implementation of temporary safeguard. Establish a team for the: a) Evaluation of permanent safeguards b) Implementation of permanent safeguards to reduce risk to an acceptable level.	
RRIII or Medium	Safeguards are re-evaluated to determine suitability and acceptability. Establish a team for the evaluation and maintenance of current safeguards. Evaluate for ALARP. Implement permanent safeguards or accept risk as per defined authority.	
RRIV or Low	Controls are reviewed to ensure effectiveness. No further risk treatment if ALARP.	

Table 4-5: Wandoo-specific supplementary environmental consequence definitions

Term used	Definition in the context of this EP
Geographical extent of impact	
Regional scale	Extent of impact across multiple bioregional provinces (EMBA).
Widespread	Extent of impact beyond the Operational Area (<200 km).
Localised off lease	Extent of impact mostly within the Operational Area with some effect extending beyond the boundaries of the area (<40 km).
Within operating area	Extent of impact limited to the Operational Area (2 km from the well location).
Socio-economic criteria: Environment criteria applies for impact and duration. Below are a range of examples for Socio-economic impacts and how they are applied to environment consequence ranking in the context of this EP	
5 Catastrophic	Widespread damage to or exclusion from commercial enterprise or collapse of commercial enterprise.
4 Major	Damage to or long-term exclusion (>10 years) from large proportion of commercial or recreational enterprise (e.g. fishery closure).

Term used	Definition in the context of this EP
3 Moderate	Medium-term (5-10 years) damage to or temporary exclusion from large proportion of commercial or recreational enterprise where recovery is expected to occur within 1 year of the activity stopping.
2 Minor	Temporary or permanent exclusion to minor proportion of commercial or recreational enterprise.
1 Incidental	Very short-term exclusion to minor proportion of commercial or recreational enterprise; or community disturbance impact e.g. low-level noise, vibration, lighting.

4.7 Determining Acceptability

For an environmental hazard to be assessed as acceptable, VOGA considers the following items:

- Principles of ESD are not compromised
- External context – objects or claims made by external relevant persons considered
- Internal context – VOGA HSE policy/procedures are being met
- Other requirements e.g. industry notices and guidance
- RR < High (RRII)
- EPO(s) manage impacts to acceptable level(s).

4.8 Evaluating Acceptability of Residual Impacts or Risks

Regulation 21(5)(c) of the OPGGS(E)R requires demonstration that environmental impacts and risks are of an acceptable level.

VOGA only considers the level of residual impact or risk to be of an acceptable level when (in combination):

- The relevant Principles of ESD have not been compromised
- Both internal and external context requirements have been achieved
- All other requirements have been met
- The predicted level of residual risk is below the level considered as unacceptable and is demonstrably ALARP.

To demonstrate that potential environmental impacts and risk associated with the exploration drilling activities are of an acceptable level, the following process has been adopted to establish an acceptable level of residual risk for each aspect of the activity (either qualitative or quantitative) considering:

- The Principles of ESD - the activity must be carried out in a manner consistent with the relevant ESD principles, namely:
  - decision making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations. This principal is inherently applied via the risk assessment methodology, inclusive of the demonstration

of ALARP, detailed within this EP, as such this principal is not evaluated separately within each hazard assessment.

- if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. This principal is applied via the ALARP process in which a precautionary approach may be adopted where residual risks may be high-level or where there is a high degree of uncertainty in the outcomes of the activity.
- the principle of inter-generational equity — that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. This principal is inherently applied via the risk assessment methodology, inclusive of the demonstration of ALARP, detailed within this EP, as such this principal is not evaluated separately within each hazard assessment.
- the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making. This principal is applied by evaluating residual risks of exploration drilling activities to particular values and sensitivities, including matters protected under Part 3 of the EPBC Act, giving consideration to relevant recovery plans and species conservation advices as detailed within Table 1-3.

- Internal context – the activity must be undertaken in a manner consistent with the objectives of the VOGA HSE policy and relevant procedural controls.
- External context – where a relevant organisations' or persons' activity, function or interest may be affected by the exploration drilling activity, any objections or claims that have been assessed as having merit and are relevant to the activity should be considered when establishing the acceptable level of residual risk of the activity. The predicted level of residual risk presented within this EP shall be taken as acceptable in the context of external stakeholder expectations when:
  - the level of residual risk is equal to or below existing Stakeholder expectations in regard to their function, activity or interest, or
  - where no objection or claim is received from a relevant organisation or person.

Other requirements - the residual risks associated with the exploration drilling activity are considered acceptable in the context of external requirements when they are within the bounds identified in relevant laws, policies, standards, conventions and do not compromise the objectives of relevant recovery plans and species conservation advices as detailed within Table 1-3.

4.9 Environmental Performance Outcomes, Environmental Performance Standards and Measurement Criteria

Environmental Performance Outcomes (EPOs), Environmental Performance Standards (EPSs), and their measurement criteria, are defined for each control to ensure overall environmental performance is maintained at ALARP and acceptable levels.

The EPOs detailed within this EP are consistent with the Principles of ESD as detailed in Section 4.8, provide for Matters Protected under Part 3 of the EPBC Act, are relevant to the

potential impacts and risks associated with the exploration drilling activity and maintain potential impacts and risks to acceptable levels based upon the context described in Section 4.8.

The EPOs detailed within this EP can be measured in various ways depending on whether the acceptable level of impact or risk is quantitative or qualitative.

Quantitative levels of performance embedded within EPOs can be directly monitored and measured either prior to or after an impact has occurred (either planned or unplanned). Qualitative levels of performance can be assessed by validating whether the EPO remains achievable, relevant, or that the EPO has been maintained (or breached).

Within the detailed hazard assessment (Section 5), in order to ensure that control measures have a clear purpose, EPOs were determined for each receptor or receptor group. Each EPO is a measurable level of performance required for the management of environmental aspects of the activity to ensure that environmental impacts and risks of the activity will be of an acceptable level. Where multiple controls protect against the same hazard, they may share a common performance outcome.

Once the performance outcome has been confirmed, a more specific statement on the level of performance required of the control is established – this is the EPS. The EPS may be a quantitative or qualitative statement of the functional requirement of a specific control. Note that for administrative controls such as procedures, EPSs are typically less specific than those for physical equipment.

Once EPOs and EPSs are developed, it is important that the performance of the control can be tracked or monitored in some way to confirm it continues to meet the performance standards. To achieve this, a measurement criterion or means of assurance is specified. The measurement criterion varies, depending on the nature of the control. VOGA would also accept internal or external audit records, maintenance and testing records, certificates, operations records, purchasing records, material specifications etc. as a means of assurance or measurement criteria.

4.10 Hazard Report Template

The risk assessment section of this EP is structured such that each of the hazards has a dedicated sub-section. Each sub-section commences with a Hazard Report Table, which is a tabular summary of the hazard, its causes, impacts and risk ranking.

Each Hazard Report Table contains:

- The activity/cause of the hazard
- EP risk number, this is a unique identification number applied to each risk
- The extent of the hazard, e.g. area disturbed, or volume released
- A high-level summary of the impacts to the environment which the hazard may cause
- A summary of the impact and risk evaluation, including residual risk
- Relevant EPO(s).

Section 5 Hazard Assessment

Planned activities and unplanned events associated with the exploration drilling pose a range of different environmental risks. The risks have been assessed using the methodology outlined in Section 4. A matrix of the hazards listed against the activities outlined in Section 2 is provided in Table 5-1. Descriptions of these hazards and how they may occur, along with measures to prevent and mitigate potential environmental impacts, are included in this section.

Table 5-1: Summary of environmental hazards for exploration drilling activities

EP risk o.	Hazard	Activity													Residual risk ranking			Impact Assessment Section
		MODU		Drilling					Formation Evaluation			Well Abandonment	Support Operations	Oil Spill Response	Impact/consequence	Likelihood	Residual risk	
		Positioning	Operations	Well Design and Drilling Method	Drilling Fluids and Cuttings	Cementing Operations	BOP Installation	Contingency Activities	Measure/Logging while Drilling	Wireline Logging	VSP							
Planned																		
EP-ED-R01	Physical presence – Interaction with other marine users	x	x										x		1	E	RRIII	5.1
EP-ED-R02	Seabed disturbance		x										x		1	E	RRIII	5.2
EP-ED-R03	Noise emissions – Continuous			x									x		1	E	RRIII	5.3
EP-ED-R04	Noise emissions - Impulsive										x				1	E	RRIII	5.4
EP-ED-R05	Atmospheric and GHG emissions		x										x		1	E	RRIII	5.5
EP-ED-R06	Light emissions		x										x		1	E	RRIII	5.6
EP-ED-R07	Vessel discharges		x										x		1	E	RRIII	5.7
EP-ED-R08	Drilling material discharges			x	x										1	E	RRIII	5.8
EP-ED-R09	Non-drilling material discharges			x		x						x			1	E	RRIII	5.9

EP risk o.	Hazard	Activity													Residual risk ranking			Impact Assessment Section
		MODU		Drilling					Formation Evaluation			Well Abandonment	Support Operations	Oil Spill Response				
		Positioning	Operations	Well Design and Drilling Method	Drilling Fluids and Cuttings	Cementing Operations	BOP Installation	Contingency Activities	Measure/Logging while Drilling	Wireline Logging	VSP				Impact/consequence	Likelihood	Residual risk	
Unplanned																		
EP-ED-R10	Accidental overboard loss of waste and solid objects		x										x		1	C	RRIV	5.10
EP-ED-R11	Introduction of IMS		x										x		3	A	RRIV	5.11
EP-ED-R12	Physical presence – Interaction with marine fauna												x		1	B	RRIV	5.12
EP-ED-R13	Minor spills		x										x		1	B	RRIV	5.13
EP-ED-R14	Accidental release of MDO												x		3	B	RRIII	5.14
EP-ED-R15	Accidental release - LOWC		x	x			x	x							4	A	RRIII	5.15
EP-ED-R16	Environmental impacts of oil spill response													x	2	B	RRIV	5.16

5.1 Planned: Physical Presence – Interaction with Other Marine Users

5.1.1 Hazard Report

Table 5-2 Hazard Report – Interaction with other marine users

HAZARD	Physical presence - Interaction with other marine users		
EP risk number	EP-ED-R01		
Activity/cause	Vessel operations MODU operations		
Extent	Operational Area		
Potential impact description	Change to other marine users' functions, interests, and activities.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Commercial fishing	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Shipping	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Relevant EPO(s)	EPO-ED-01 Undertake the activities in a manner that does not interfere with other marine users to a greater extent than is necessary for the exercise of the rights conferred by the titles granted.		

5.1.2 Description of Hazard

The MODU and vessels will be present within the Operational Area during exploration drilling activities. A maximum of two wells will be drilled within a single campaign which are estimated to take ~20 days each to complete. Concurrent vessel activities have the potential to occur in the Operational Area, particularity during MODU positioning. This scenario would include the MODU, and up to 2 AHTS. A third vessel of similar or lesser specifications may also be used during rig moves and to provide additional logistical support. A 500 m safety exclusion zone will be required around the MODU for the duration of activities which will only occur within the Operational Area.

5.1.3 Impact and Risk Evaluation

Potential impacts to other marine users and associated values from the exploration drilling activities include:

- Potential slight changes to their functions, interests, and activities.

The following receptors within the Operational Area may be impacted by the physical presence:

- Commercial fisheries
- Shipping.

5.1.3.1 Impact Assessment

Other Marine Users

Changes to the Functions, Interests and Activities

Commercial Fisheries and Recreational Fishing

Displacement of fisheries and recreational fishing may occur due to the safety exclusion zone placed around the MODU and the physical presence of support vessels within the Operational Area. The potential for interaction with other marine users and MODU and vessel activities will be greatest during MODU positioning activities where a maximum of 3 AHTS and the MODU may be present.

As described in Section 3.5, 2 WA-managed fisheries with catch-effort were recorded within the 10 NM reporting block overlapping the Operational Area. The Operational Area intersects the Pilbara Fish Trawl (Interim) Managed Fishery, which is managed through designated areas (or zones) restricting the catch method allowed within that area. The Operational Area overlaps the Trap Fishing only area, and Area 1 (trawl and trap fishing allowed). The assessment of 10-year fishing effort indicated a maximum number of 4 vessels were active within the entire fishery. If trawl vessels encounter project vessels, they may be required to deviate slightly from trawl lines. The likelihood of this would be reduced through on-water communications and consultation and is limited to only the small portion of the fishery management area which overlaps the Operational Area. A safety exclusion zone will be placed around the MODU for the duration for activities and will occur within the Operational Area. Short-term and temporary impacts may be expected to the fishery.

Up to 3 tour operator licence holders recorded effort in the 10 NM CAES block overlapping the Operational Area. The Dampier Archipelago (approximately 35 km southeast) and the Glomar Shoals (approximately 40 km northeast) are the closest features where tour-operators are likely to access. Fishing tour operators that provide charters in north-west Western Australia are mainly focused around Exmouth and islands such as the Abrolhos and Montebello Islands (Blue Horizon Charters, 2022; Top Gun Charters, 2020). As noted in Section 3.5.1, DPIRD's FishCube fishing effort data between 2013 – 2023 notes that there were active fishing Tour Operators within the Operational Area, which correlates with the Wandoo platform being listed as a recreational fishing site by DPIRD (2023) (Section 3.5.4.1) and correspondence from RecfishWest (Sensitive Information Report, reference 2.9). The area is used for deepwater fishing by fishing charters and large private fishing boats. The survey activities will not require an exclusion zone, therefore no displacement from fishing areas is expected. Short-term and temporary impacts may be expected to the recreational fishing.

Fisheries recorded as active within the 60NM reporting blocks that intersect the Operational Area include the:

- Hermit Crab Fishery
- Mackerel Managed Fishery
- Marine Aquarium Fish Managed Fishery
- Nickol Bay Prawn Managed Fishery

- Onslow Prawn Managed Fishery
- Pilbara Crab Managed Fishery
- Pilbara Fish Trawl (Interim) Managed Fishery
- Pilbara Line Fishery (Condition)
- Pilbara Trap Managed Fishery
- Specimen Shell Managed Fishery
- Tour Operator
- West Australian Sea Cucumber Fishery.

The Marine Aquarium Fish, Hermit Crab, Specimen Shell, and the West Australian Sea Cucumber fisheries operate in coastal, nearshore waters via hand-catch or dive methods. Given the distance from shorelines and water depths in the Operational Area, impacts from physical presence of vessels are not considered likely.

The Pilbara Trap and Mackerel Managed fisheries may be present in the Operational Area. The Pilbara line and Mackerel managed fisheries operate via line-surface trolling for pelagic species. The Pilbara crab managed fishery operates using hourglass traps, primarily within inshore waters around Nickol Bay (Newman et al., 2023a). The Pilbara Trap managed fishery uses baited trap gears in depths of ~30-200 m (DCCEEW, 2023b). Interactions with these fisheries from vessel operations are likely to be limited to very-short term impacts to a minor portion of any fishery management area.

The Nickol Bay and Onslow Prawn managed fisheries are managed through spatial closures (designated fishing areas). The Nickol Bay management area does not overlap the Operational Area, therefore planned activities are not likely to interact with the fishery. The Onslow Prawn managed fishery is limited to Area 3, which overlaps the Operational Area. Fishing effort is typically targeted in the nearshore and coastal waters, west of the Dampier archipelago (Newman et al., 2023b). Given the distance from suitable and previous targeted areas, it is not considered likely the physical presence of vessels could have any interactions with the Onslow Prawn fishery.

No Commonwealth managed fisheries were recorded to have previous catch effort in the Operational Area, therefore are unlikely to have any interaction with planned activities.

Shipping

Shipping activities are expected to be low, with no shipping fairways crossing the Operational Area. As detailed in Section 3.5.2, established shipping fairways are approximately 3 km south of the Operational Area. Vessel interactions during the activity will be managed in accordance with navigational requirements. Given the short-term duration of activities and localised safety exclusion zone, impacts to shipping activities are considered incidental.

5.1.4 Risk Ranking

The Operational Area is characterised by soft, unconsolidated sediments with no known features of significance to fisheries (emergent features, reef or outcrops). Previous fishing effort

has remained relatively low (< 5 active vessels per year), for fisheries with the potential to interact with the exploration drilling campaign. Impacts to commercial fisheries from the physical presence of MODU and support vessels will be very-short term and a minor proportion of the wider management area. Therefore:

- The consequence ranking of '1' (Incidental) was assigned to potential interactions with other marine users, and likelihood of 'E' (Almost Certain) was considered appropriate, resulting in a risk ranking of 'Medium' (RRIII).

5.1.5 ALARP Demonstration

Table 5-3: Demonstration of ALARP – Physical presence – Interaction with other marine users

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-
Prevention			
Functional communication equipment on board MODU and AHTS vessels to communicate with commercial and recreational shipping vessels in the vicinity of the activities.	EPO-ED-01	Communication equipment on board MODU and vessels, shall be functional and maintained in accordance with the contractor's Preventative Maintenance System (PMS).	VOGA inspection or audit confirms application of contractor's PMS. Communication equipment on board MODU and vessels are included in the contractor's PMS.
Intent to move MODU to or from field is notified in advance to AMSA.	EPO-ED-01	Notify relevant agency of activities, vessel movements, and requested safety exclusion zone, to enable them to generate radio-navigation warnings and/or Notice to Mariners prior to commencing offshore activities.	Record of lodgement of notification to relevant agency.
Operational Area has a Petroleum Safety Zone (PSZ) and the MODU has a restricted zone of 500 m for unauthorised vessels.	EPO-ED-01	The restricted zone is limited to a 500 m radius around the MODU.	Record of lodgement of notification to relevant agency.
Notification of activities direct to relevant persons.	EPO-ED-01	Relevant persons to be identified and notified as appropriate prior to	Record of relevant person assessment

Control measure	Performance outcome	Performance standard	Measurement criteria
		activity, in accordance with Table 9-6.	and correspondence.
Vessels to adhere to the navigation safety requirements including the *Navigation Act 2012* and any subsequent Marine Orders.	EPO-ED-01	Vessels compliant with *Navigation Act 2012* and Marine Order 21 (Safety of navigation and emergency procedures) and Marine Order 30 (Prevention of collisions).	Marine assurance inspection records demonstrate compliance with standard maritime safety procedures.
Reduction			
None identified	-	-	-
Mitigation			
None identified	-	-	-
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
None identified	-		-
ALARP Summary: The impacts of physical presence to other marine users are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-4), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.			

5.1.6 Acceptability Demonstration

Table 5-4: Acceptability demonstration – Physical presence – Interaction with other marine users

ACCEPTABLE LEVEL OF RISK DEMONSTRATED	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-3).
External context – objections or claims considered	N/A – No external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes – Notice to Mariners issued via AMSA in a timely manner. Yes – *Navigation Act 2012.*
RR < High (RRII)	Yes – Medium (RRIII).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-01 See Section 7 for further details.

Acceptability Summary
The potential impacts of the physical presence of the MODU and vessel operations interacting with other marine users have been managed to a level that is broadly acceptable based on the demonstration of ALARP table (Table 5-3), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7)

5.2 Planned: Seabed Disturbance

5.2.1 Hazard Report

Table 5-5: Hazard Report – Seabed disturbance

HAZARD	Seabed disturbance		
EP risk number	EP-ED-R02		
Activity/cause	MODU operations Drilling activities ROV operations		
Extent	Seabed disturbance of up to 4,500 m^2		
Potential impact description	A change in water quality, and localised adverse effect to benthic habitats and assemblages.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Benthic habitats and assemblages	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Water quality	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Submerged cultural heritage	Incidental (1)	Rare (A)	Low (RRIV)
Relevant EPO(s)	EPO-ED-02 No serious or irreversible changes to the seabed which may adversely impact on biodiversity, ecological integrity, social amenity or human health.		

5.2.2 Description of Hazard

MODU activities, drilling activities, contingency activities, and ROV operations will contact the seabed. The following activities will cause seabed disturbance:

- Drilling activities—Once the surface hole sections of the well have been drilled, steel pipes called conductors are inserted into the wellbore and cemented in place which will result in direct disturbance to the seabed.
  - Drilling of the surface hole, including penetration, will disturb approximately 0.67 m^2 per well.
- MODU activities—The proposed wells will be drilled using a jack-up MODU which has legs which will be stationed on the seabed footing. There may be up to 7 exploration wells drilled.

  - The area of seabed affected by installation of the MODU legs on the seafloor may result in a seabed disturbance of up to 575 m^2 per location.

- Contingency activities—In the event of technical or operational issues during the drilling activity, contingency activities (well re-spud/sidetrack, well suspension, and cementing operations) may be required. The activities are not expected to cause additional risks or impacts but may result in seabed disturbance.
  - Seabed disturbance is expected to be the same as those described in drilling activities, MODU activities, and ROV operations.
- ROV operations—Use of an ROV during drilling activities as described in Section 2.10.3 may result in temporary seabed disturbance and suspension of sediments as a result of working close to, or occasionally on the seabed.
  - Additionally, the ROV may be wet-parked on the seabed which will cause localised and temporary impacts to benthic habitats and water quality from increased turbidity. The footprint of a typical ROV is likely to be no bigger than 1.7 m^2.
- Support vessels – Planned anchoring for up to three AHTS support vessels within the Operational Area to support drilling activities during each campaign. A vessel using a single anchor could result in seabed disturbance of up to 1,300 m^2 (NERA, 2018).

The total area of seabed disturbance for the above activities will be less than 4,500 m^2.

5.2.3 Impact and Risk Evaluation

Potential impacts to the seabed and its associated features from the exploration drilling activities include:

- Change to benthic habitat and assemblages
- Change to water quality
- Change to submerged cultural heritage.

The following receptors within the Operational Area may be impacted by seabed disturbance:

- Benthic habitats
- Benthic invertebrates
- Water quality
- Submerged cultural heritage.

Given that there are no discernible impacts on commercially important demersal species at either an individual or population level due to the nature and scale of the potential seabed disturbance, social and economic impacts on commercial fisheries have not been evaluated.

5.2.3.1 Impact Assessment

Water Quality

Change to Water Quality

Seabed disturbance has the potential to result in a localised and temporary increase in suspended sediment concentrations, turbidity and increased sediment deposition caused by drilling activities, MODU footing, contingency activities, and ROV operations on and near the seabed. After a period, suspended sediments will settle and the turbidity in the water column will return to pre-disturbance levels.

Sediment loads are not expected to be significant due to the relatively small footprint for each activity. Each activity near the seabed is likely to cause a single brief disturbance resulting in a transient plume of suspended sediment, within an area of predominantly soft sand habitat. Given the hydrodynamics in open areas, the area of decreased water quality is expected to be localised and temporary, and sediments would settle relatively quickly (NERA, 2018).

Benthic Habitats and Assemblages

Change to Benthic Habitat and Assemblages

The benthic habitat of the Operational Area has been identified as consistent with the sediments found throughout the NWS Province, consisting of soft, sandy, unconsolidated sediments (Section 3.4.1). No coral, seagrasses, or macroalgae habitats or significant seabed or benthic features were recorded within the Operational Area (Section 3.4).

Marine life such as deep water benthic communities epifauna and infauna (living on and in the sediment dominated habitat), may be impacted from the placement of placement of temporary supporting infrastructure (MODU footing and ROV) on the seabed. Potential impacts include burial or smothering of benthic biota from localised sediment deposition, particularly to sessile epifauna such as sea pens and infauna (polychaetes), and sediment coating resulting from increased turbidity potentially smothering or causing or damage to the physiological functioning of certain biota (sea pens, polychaetes) reliant on external respiratory and feeding structures. Secondary impacts may include alterations to epifauna and infauna community changes (Newell et al., 1998).

Benthic invertebrates present within the Operational Area are expected to be typical of the NWS region, of highly diverse species, such as borrowing polychaete worms and crustaceans, in low abundance (Section 3.4.3.2). The diversity and abundance of benthic invertebrates has been identified to decrease with increasing distances from the coast within the NWS region (SKM, 1996). No species or ecological communities listed as threatened under the EPBC Act, critical habitats, sensitive or protected benthic habitat or species, have been identified in the Operational Area.

As discussed in Section 5.2.2, the greatest seabed disturbance footprint will be limited to wellbores, MODU footing footprints, and AHTS anchoring within the Operational Area with a maximum spatial extent of 4,500 m^2 expected to be disturbed during activities. Any impact is predicted to be in the immediate vicinity of the AHTS vessel anchoring, MODU footing, and wellbore locations. The duration of disturbance is expected to be short-term, up to 20 days for

each well (up to 7 wells); therefore, any impact to benthic habitats will be highly localised and temporary in nature.

Given the localised nature of the disturbance and the lack of significant benthic habitat and assemblages in the region, potential impacts to benthic habitats and assemblages from project activities are not anticipated to impact marine ecosystem functioning.

Submerged Cultural Heritage

Change to Submerged Cultural Heritage

Seabed disturbance from MODU operations, drilling activities, BOP installation and ROV operations has very low potential to cause a change to submerged cultural heritage sites, given the small areas of seabed disturbance involved. As described in Section 3.6.3, Australia's underwater cultural heritage, such as shipwrecks, sunken aircrafts, First Nations underwater cultural heritage, and other underwater heritage sites are protected under the UCH Act. No cultural heritage artefacts, such as shipwrecks or registered Aboriginal Cultural Heritage sites, have been identified within the Operational Area (Section 3.6.3 and 3.7.5). Any impact to submerged cultural heritage is expected to be incidental.

5.2.4 Risk Ranking

The seabed of the Operational Area is characterised by soft, unconsolidated sediments with limited sensitive features, benthic assemblages, no known underwater cultural heritage sites. Impacts to these receptors from seabed disturbance will be temporary and considered to be localised and minimal. Therefore:

- The consequence ranking of '1' (Incidental) was assigned to benthic habitats and assemblages, and a likelihood of 'E' (Almost Certain) was considered appropriate, resulting in a risk ranking of 'Medium' (RRII).
- The consequence ranking of '1' (Incidental) was assigned to water quality and a likelihood of 'E' (Almost Certain) was considered appropriate, resulting in a risk ranking of 'Medium' (RRII).
- The consequence ranking of '1' (Incidental) was assigned to submerged cultural heritage, and a likelihood of 'A' (Rare) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).

5.2.5 ALARP Demonstration

Table 5-6: Demonstration of ALARP – Seabed disturbance

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-

Prevention			
None identified	-	-	-
Reduction			
Rig Move Plan will be prepared in general accordance with Drilling Contractor's Marine Operations Manual.	EPO-ED-02	MODU footings will be placed in a controlled fashion according to Rig Move Plan.	Records of MODU operations.
Mitigation			
None identified	-	-	-
Other			
Unexpected finds of potential underwater cultural heritage sites/features are to be reported.	EPO-ED-02	In the event an underwater cultural heritage site or feature is identified, the Minister will be identified within 21 days through the Australasian Underwater Cultural Heritage Database tool.	Record of relevant person correspondence.
Considered Control Measures	**Assessment of option**		**Decision**
Positioning technology used to place MODU within the design footprint to reduce seabed disturbance.	Soft pinning not required as open water location.		Not adopted.
	Rig positioning system provides real time, reliable position and accurate to within <0.5 m. Sufficient for determining rig position.		Adopted (refer to Table 7-2).
No anchoring of support vessels.	Reduces the area of seabed disturbance. Cost of additional diesel fuel will be substantial (tens of thousands of dollars). The featureless seabed of the activity area means there is no environmental benefit in preventing vessels from anchoring if they need to. Anchoring, if required, will save the volume of fuel consumed and reduce associated atmospheric emissions.		Not adopted.
Zero discharge of cuttings.	Due to use of WBM, maximum two wells per campaign, and shallow well depths, the costs of capturing drilled cuttings at surface and disposing of them onshore outweigh the environmental benefits.		Not adopted.
Conductor will be severed at the seabed post drilling.	Due to design of well, no potential to leave conductor (and wellhead) in place after rig departure.		Adopted (refer to Table 7-2).
UCH finds procedure.	No concerns were raised about the potential for UCH (in the Operational Area) during relevant person consultation. The probability of an impact to UCH		Not adopted.

	occurring has been assessed as rare. At water depths greater than 50 m, finding UCH becomes less likely. The likelihood of finding UCH suggest this control is disproportionate to the limited potential benefit.	
ALARP Summary: The impacts to seabed disturbance from drilling activities are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-4), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). Through the ALARP process, additional controls have been identified that would further reduce the impacts without disproportionate sacrifice.		

5.2.6 Acceptability Demonstration

Table 5-7: Acceptability demonstration – Seabed disturbance

ACCEPTABLE LEVEL OF RISK DEMONSTRATED	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-6).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes – Risk to underwater cultural heritage managed in accordance with the UCH Guidelines.
RR < High (RRII)	Yes – Medium (RRIII).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-02 See Section 7 for further details.
Acceptability Summary The impacts of seabed disturbance have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-7), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.3 Planned: Noise Emissions – Continuous

5.3.1 Hazard Report

Table 5-8: Hazard Report – Continuous noise emissions

HAZARD	Noise emissions – continuous
EP risk number	EP-ED-R03
Activity/cause	Vessel operations Drilling activities
Extent	The maximum predicted range for exceeding marine fauna impact thresholds was 20.7 km from the Operational Area for the marine mammal behavioural response threshold (Wecker et al., 2022).

Potential impact description	Masking or interfering with biologically important sounds. Change in fauna behaviour leading to disturbance or displacement of fauna. *Note: The risk rankings below relate to change in marine fauna behaviour (leading to disturbance, or displacement and including masking). Temporary or permanent injury to marine fauna is not credible as evaluated in Section 5.3.4.*		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Fish, sharks and rays	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Marine reptiles	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Marine mammals	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Relevant EPO(s)	EPO-ED-03 Impacts to marine fauna from noise emissions will be limited to temporary behavioural change localised to the noise source, with no species population-level impacts.		

5.3.2 Description of Hazard

During the exploration drilling activities, continuous noise emissions will be generated from:

- Vessel operations
- Drilling activities.

Vessel Operations

Vessels used to undertake the activity include the jack-up rig, and up to 3 support vessels.

Continuous underwater noise generated from vessel operations is expected from support vessel operations. Up to 3 support vessels may operate within the Operational Area using dynamic positioning (thrusters) and propulsion systems (propellers) which will cause cavitation and generate continuous underwater noise (DOSITS, 2021). The maximum duration that support vessels are expected to be present within the Operational Area is 40 days (for a single campaign). Sound source levels of around 187.6 dB re 1 μPa^2m^2, as measured by JASCO from the Fugro Etive (Stroot et al., 2022), are expected from support vessels undertaking dynamic positioning operations for this activity.

The jack-up rig is not expected to generate continuous underwater noise as part of vessel operations. The jack-up rig will be towed to location. MODU operations will not include dynamic positioning or self-propulsion operations. During drilling activities, underwater noise is expected from the MODU's drill stem (see below).

Drilling Activities

Once the jack-up rig legs are stationed on the seafloor, drilling activities will commence. The rotation of the drill stem when drilling through substrate material will produce low-intensity continuous underwater noise (Todd et al., 2020). The MODU is expected to be on location ~15-

20 days per well. Sound source levels of around 175.4 dB re 1 μPa^2m^2, as measured by JASCO from the Ocean Onyx whilst anchoring and drilling (Stroot et al., 2022), are expected from drilling activities for this activity. The Ocean Onyx, during anchored drilling, exhibits a sound source level comparable to a drilling jack-up rig, primarily because both MODUs avoid continuous underwater noise associated with dynamic positioning or propulsion during drilling activities.

5.3.3 Noise Modelling

The following modelling studies conducted by JASCO in North West Shelf waters (<200 m depth) are suitable analogues to the Wandoo drilling activity, due to similar sound speed profiles and geo-acoustics of these shelf environments:

- Woodside drilling operations at Julimar South-1 (Stroot et al., 2022)
- Woodside drilling operations at XNA02 (Wecker et al., 2022)
- Chevron drilling operations at Area 5, on the continental shelf (Warren et al., 2023).

The modelling scenarios used in this assessment from the analogue studies are listed as follows:

- Stroot et al. (2022) – Scenario 5: Anchored MODU drilling (24 hr) + support vessel, under DP (8 hr) + support vessel on standby (24 hr)
- Wecker et al. (2022) – Scenario 10: MODU under DP[2], drilling (24 hr) + support vessel, under DP (8 hr) + support vessel on standby (24 hr)
- Warren et al. (2023) – Scenario 30: MODU under DP + OSV under DP 8 hr.

5.3.3.1 Noise Effect Criteria and Results

Different species groups perceive and respond to sound differently, and so a variety of exposure criteria for the different types of impacts and species groups are considered. The following continuous noise effect thresholds were used in the impact and risk assessment:

- Frequency-weighted accumulated Sound Exposure Levels (SEL_{24h}) from Southall et al. (2019) for the onset of Permanent Threshold Shift (PTS) and Temporary Threshold Shift (TTS) in marine mammals
- Un-weighted Sound Pressure Level (SPL) for behavioural threshold for marine mammals based on NOAA (2024)
- Sound exposure guidelines for fish, fish eggs, and larvae (Popper et al., 2014)
- Frequency-weighted accumulated sound exposure levels (SEL_{24h}) from Finneran et al. (2017) for the onset of PTS and TTS in marine turtles.

Recent Commonwealth guidance has defined “injury to blue whales” as both PTS and TTS hearing impairment, as well as any other form of physical harm arising from anthropogenic sources of underwater sound (DAWE, 2021).

[2] Scenario 10’s MODU under DP is considered a conservative representation of a potential third support vessel for the Wandoo exploration drilling activities.

The NOAA (2024) behavioural threshold for marine mammals of a SPL at 120 dB re 1µPa is current best available science. This is based on Southall et al. (2007) and Southall et al. (2021) literature reviews and studies in relation to marine mammal behavioural response to continuous sound emissions.

New, more conservative thresholds for auditory injury (which includes PTS)[3] and TTS to marine mammals have recently been published within the *Update to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0): Underwater and In-Air Criteria for Onset of Auditory Injury and Temporary Threshold Shifts* (NMFS, 2024). The updated thresholds now consider both the weighting function shape and the weighted threshold value. As the changes to these auditory weightings are more conservative than those previously proposed by Southall et al. (2019), VOGA anticipates that the updated auditory weighting functions, exposure function parameters, and received level thresholds for auditory injury and TTS may result in larger predicted spatial areas of auditory injury and TTS to marine mammal hearing groups.

Given the very short distances reached by the previous injury thresholds (PTS and TTS) (<3.33 km), any potential increase to the extent using the new thresholds are not expected to surpass the extents predicted for the behavioural threshold for marine mammals (9 km up to 21 km), which has substantially lower received levels. Furthermore, due to the nature and scale of the activity, the noise exposure extents are expected to only intersect with one BIA for marine mammals; a humpback whale Migration BIA, which has no associated recovery plan or conservation advice (Figure 3-10). Considering there are no regionally significant feeding, breeding or aggregation areas for marine mammals in the Operational Area, impacts are anticipated to be low and likely to be limited to transient individuals only. As such, even in the event that the new NMFS (2024) thresholds were to be modelled the impact evaluation for marine mammals is likely to remain unchanged. The adopted measures in Section 5.3.6 are developed based on the maximum ranges to the behavioural threshold (21 km), therefore, they will continue to protect marine mammals from auditory injury (which includes PTS) and TTS to marine mammals, in doing so meeting EPO-ED-03 and the acceptable level of impact. As such, the use of the updated NMFS (2024) thresholds is very unlikely to indicate unacceptable impacts to noise-sensitive receptors in or near the Operational Area, including migrating humpback whales.

Accomando et al. (2025) has suggested updates to the underwater sound exposure thresholds for marine turtles within the 2024 *Criteria and Thresholds for U.S. Navy Acoustic and Explosive Effects Analysis (Phase 4*). These thresholds were not used within the analogue modelling studies, and subsequently have not been incorporated into impact assessment. VOGA anticipates that the updated auditory weighting functions, exposure function parameters, and received level thresholds for PTS and TTS may result in larger predicted spatial areas exposure than the thresholds previously suggested by Finneran et al. (2017). The received sound level thresholds for the behavioural thresholds have remained unchanged.

[3] The updated technical guidance (NMFS, 2024) details the inclusion of the term "auditory injury (AUD INJ)" to replace "PTS". AUD INJ is defined as 'damage to the inner ear that can result in destruction of tissue, such as the loss of cochlear neuron synapses or auditory neuropathy. Auditory injury may or may not result in a permanent threshold shift (PTS)' (NMFS, 2024). Given the new, more conservative threshold for AUD INJ has not been incorporated into the impact assessment within this EP, the use of AUD INJ instead of PTS has been deemed as inappropriate for the level of assessment within this EP. As such, the term "PTS" has been used throughout.

To account for the scientific uncertainty from the absence of predictions using the Accomando et al. (2025) thresholds, VOGA have chosen to use the PTS and TTS thresholds for low-frequency cetaceans as a proxy for the potential PTS and TTS for marine turtles within the impact assessment within Section 5.4.4.1. This is considered a highly conservative and precautionary approach, given the PTS and TTS thresholds for low frequency cetaceans are lower than those for marine turtles and the weighting function applied is based on low-frequency cetaceans which have a more sensitive and broader hearing frequency range than marine turtles.

Current available literature on sound exposure impacts to marine invertebrates from continuous noise is limited and inconclusive and is not discussed further in this section.

There are no thresholds for underwater sound impacts to either seabirds or shorebirds. Therefore, the impacts to birds has not been assessed further.

A summary of the noise effect criteria used in the impact assessment for fish, marine reptiles and marine mammals and the relevant literature is provided in the analogue studies (Stroot et al., 2022; Wecker et al., 2022; Warren et al., 2023) and below in Table 5-9 to Table 5-11.

Table 5-9: Continuous noise criteria threshold for fish

Receptor	Behaviour	Mortality and potential mortal injury	Impairment		
			Recoverable injury	TTS	Masking
Fish: No swim bladder (particle motion detection)	(N) Moderate (I) Moderate (F) Low	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate
Fish: Swim bladder not involved in hearing (particle motion detection)	(N) Moderate (I) Moderate (F) Low	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate
Fish: Swim bladder involved in hearing (primarily pressure detection)	(N) High (I) Moderate (F) Low	(N) Low (I) Low (F) Low	170 dB SPL for 48h	158 dB SPL for 12h	(N) High (I) High (F) High
Fish eggs and fish larvae	(N) Moderate (I) Moderate (F) Low	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) High (I) Moderate (F) Low

Source: Popper et al. (2014)
Note: Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N), intermediate (I), and far (F).

Table 5-10: Continuous noise criteria threshold for marine turtles

Receptor	Masking	Behaviour	Finneran et al. (2017)		Accomando et al. (2025)	
			PTS	TTS	PTS	TTS
			Weighted SEL_{24h} (LE,24h; dB re 1µPa^2s)		Weighted SEL_{24h} (LE,24h; dB re 1µPa^2s)	
Marine turtle	(N) High (I) High (F) Moderate	(N) High (I) Moderate (F) Low	220	200	198	178

Source: Popper et al. (2014); Finneran et al. (2017); Accomando et al. (2025)
Note: Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N) – tens of meters, intermediate (I) - hundreds of meters, and far (F) – thousands of meters.

Table 5-11: Continuous noise criteria threshold for marine mammals

Receptor	Hearing group	Behavioural	NMFS (2018)		NMFS (2024)	
			PTS	TTS	AUD INJ	TTS
		SPL (L_p; dB re 1µPa)	Weighted SEL_{24h} (L_E,24h; dB re 1µPa^2s)		Weighted SEL_{24h} (L_E,24h; dB re 1µPa^2s)	
Marine mammals	Low-frequency (LF) cetaceans	120	199	179	197	177
	High-frequency (HF) cetaceans		198	178	201	181
	Very High-frequency (VHF) cetaceans		173	153	181	161

Source: NMFS (2018; 2024); Southall et al. (2019)
Note: Lp denotes sound pressure level period and has a reference value of 1 µPa.
LE denotes cumulative sound exposure over a 24h period and has a reference value of 1 µPa^2s.

Table 5-12: Distances to PTS, TTS and behaviour effects from continuous noise from drilling operations on the North West Shelf (Stroot et al., 2022; Wecker et al., 2022; Warren et al., 2023)

Hearing Group	Noise Effect Criteria	Maximum Rmax Distance (km)			Reference
		Scenario 5	Scenario 10	Scenario 30	
Fishes: (swim bladder): recoverable injury	>170 dB SPL for 48 h	Not reached	Not reached	Not reached	Popper et al. (2014)
Fishes: (swim bladder): TTS	>158 dB SPL for 12 h	Not reached	Not reached	0.07	Popper et al. (2014)
Marine mammals: behavioural	120 dB SPL	8.85	20.7	10.4	NMFS (2024)

Hearing Group	Noise Effect Criteria	Maximum Rmax Distance (km)			Reference
		Scenario 5	Scenario 10	Scenario 30	
Low-frequency cetaceans: PTS (humpback and pygmy blue whales)	197 dB SEL_{24h}	0.07	0.13	0.11	NMFS (2018)
Low-frequency cetaceans: TTS (humpback and pygmy blue whales)	177 dB SEL_{24h}	0.92	2.66	1.66	NMFS (2018)
High-frequency cetaceans: PTS (dolphins, beaked whales, sperm whales)	201 dB SEL_{24h}	0.02	0.09	0.05	NMFS (2018)
High-frequency cetaceans: TTS (dolphins, beaked whales, sperm whales)	181 dB SEL_{24h}	0.13	0.13	0.16	NMFS (2018)
Very High-frequency cetaceans: PTS (pygmy and dwarf sperm whales)	181 dB SEL_{24h}	0.19	0.15	0.21	NMFS (2018)
Very High-frequency cetaceans: TTS (pygmy and dwarf sperm whales)	161 dB SEL_{24h}	2.76	2.63	3.33	NMFS (2018)

5.3.4 Impact and Risk Evaluation

Potential impacts caused by continuous underwater noise include:

- Change in fauna behaviour, including:
  - masking - interfering with other biologically important sounds, including vocal communication, echolocation, signals, and sounds produced by predators or prey.
- Injury/mortality to marine fauna, such as:
  - recoverable injury
  - mortality or potential mortal injuries
  - TTS
  - PTS.

Potential receptors that may be impacted are:

- Fish, sharks and rays (including eggs and larvae)
- Marine reptiles
- Marine mammals.

5.3.4.1 Impact Assessment

Continuous underwater noise generated by the activity will impact ambient sound levels in the NWS continental shelf.

Significant commercial shipping activity occurs across the NWS, the majority of which is associated with the WA oil and gas and mining industries. The closest AMSA shipping fairway is ~3 km south of the Operational Area (Figure 3-36). Shipping fairways provide a significant and continuous contribution to the ambient sound levels in the Operational Area.

Oil and gas activities, and strong weather conditions (cyclonic events) also contribute to the ambient sound levels in the Operational Area. The temporary generation of underwater sound from the activity will introduce and replicate existing oil and gas activities' contributions to ambient sound levels.

Fish, Sharks, and Rays

Several species of fish, sharks, and rays may be present within the Operational Area and surrounds. Many species of fish, sharks, and rays are expected to be transient individuals due to the absence of critical habitats found within the Operational Area (Section 3.4.1). However, the Wandoo A and Wandoo B facilities located within the Operational Area provide artificial hard substrate which can form the basis of relatively high biodiversity communities and have been shown to support more diverse fish assemblages in comparison to the surrounding seabed (McLean et al., 2017; Bond, 2018).

A foraging BIA for the whale shark is overlapped by the Operational Area (Section 3.4.4). This species is known to aggregate at Ningaloo between March and July each year to feed. This species is found in coastal and oceanic environments making them potentially vulnerable to noise emissions.

Change in Behaviour

Fish, sharks, and rays have been identified to be susceptible to behavioural change, such as avoidance, in response to continuous noise emissions generated by vessel operations (Chapius et al., 2019; Popper et al., 2014). Currently, quantitative threshold criteria for behavioural responses of fishes from continuous sound do not exist (Popper et al., 2014). Fishes are highly likely to exhibit behavioural disturbances within tens of metres from continuous sound sources (Popper et al., 2014). Behavioural disturbances to fishes from underwater sound are therefore localised and limited to within the Operational Area. There are no habitats or features within the Operational Area that would restrict fish, sharks, and rays from moving away from vessel operations and drilling activities.

Fish, sharks, and rays in the Operational Area are likely to exhibit avoidance responses from continuous sounds generated and radiated by the activity (Carroll et al., 2017). Fish, sharks, and rays that do not avoid underwater sound radiated by the activity are likely to exhibit changes to schooling patterns and distribution from continuous sound (McPherson et al., 2016). Behavioural changes for some fish species are temporary and short lived (i.e. nuisance factor) and displacement of pelagic or migratory fish populations is unlikely (McCauley, 1998).

A foraging BIA for the whale shark was the only BIA for fish, shark, and ray species to be overlapped by the Operational Area. The Operational Area does not overlap the high density prey foraging BIA for Whale Sharks. The closest aggregation area for Whale Sharks is Ningaloo located ~300 km from the Operational Area. The Whale Shark Recovery Plan 2005-2010, which has not been superseded, does not list noise disturbance as a threat to whale sharks (DCCEEW, 2005). Whale sharks are found year-round in the wider NWS, not just during their peak aggregation in April and May at Ningaloo's foraging BIA. Temporary and localised behavioural changes to whale sharks may occur within the Operational Area, these changes are not expected to result in ecologically significant impacts at a population level.

Behavioural disturbance to fish, sharks, and rays, is expected to be limited to temporary and localised changes within the vicinity of support vessels and drilling locations within the Operational Area and will not impact population or ecosystem functioning.

Injury/Mortality

Popper et al. (2014) found no direct evidence of fish mortality or potential mortal injury from ship sound emissions. Based on this observation, it is inferred that continuous noise from drilling activities will also not result in fish mortality or potential mortal injury. For fish lacking swim bladders or with swim bladders not used for hearing (e.g. sharks), the risks of lethal or recoverable injuries are low, with temporary threshold shifts (TTS) in hearing posing a moderate risk within tens of meters of the vessel. For fish using swim bladders for hearing, mortality risks remain low, though, quantitative thresholds for potential recoverable injury and TTS were proposed for fish using swim bladders for hearing, i.e. 170 dB SPL (48h) and 158 dB SPL (12h), respectively (Table 5-9) (Popper et al., 2014). The impact of noise emission to fish is based on the classification of fish into 2 categories based on the presence or absence of a swim bladder; which is known to aid in hearing by transmitting vibrations to the inner ear (Popper et al., 2014). There is limited research that has been conducted on the response of sharks to noise emissions. In comparison to bony fish, sharks lack a swim bladder, and therefore are unlikely to respond to acoustical pressure. Due to an overall lack of observational data on impacts to fish from continuous sources, Popper et al. (2014) proposed qualitative indicators of relative risk of effects indicating that 170 dB SPL (48h) has the potential to result in a recoverable injury and 158 dB SPL (12h) has the potential to result in TTS impacts to fish that have a swim bladder involved in hearing (Table 5-9).

Table 5-12 shows these threshold criteria were not reached for noise modelling conducted by Stroot et al. (2022) and Wecker et al. (2022). However, noise modelling by Warren et al. (2023) for Scenario 30 predicted:

- 12h TTS criteria was reached within 0.07 km
- 48h recoverable injury criteria was not reached.

No habitats likely to support site-attached fish have been identified within the Operational Area, therefore it is unlikely that fish species would be present within 70 m of continuous sound sources for a period of 12 hours to experience the onset of TTS. Therefore, recoverable injury or TTS due to continuous underwater noise within the Operational Area are not considered credible.

Marine Reptiles

Several species of marine turtles may be present within the Operational Area and surrounds; however, the internesting BIA buffer for the flatback turtle was the only BIA identified to overlap the Operational Area (Section 3.4.3.6).

Change in Behaviour

There is a paucity of data regarding how marine turtles respond to underwater noise. Studies have indicated that marine turtles use noise for navigation, to avoid predators and to find prey (Dow Piniack, 2012) and electro-physical studies have indicated that marine turtle detect a limited frequency range of sounds between 200–700 Hz (Bartol and Musick, 2003).

Specific data on behavioural response thresholds, such as avoidance or masking, of marine turtles to continuous sound emissions do not exist (Popper et al., 2014). Using semi-quantitative analysis, Popper et al. (2014) suggests there is low risk of masking and behavioural change to marine turtles from continuous sound within thousands of metres from the sound source. This suggests avoidance behaviours may occur within the Operational Area.

The Recovery Plan for Marine Turtles in Australia 2017-2027 lists noise disturbance from acute and chronic sources as a threat (Commonwealth of Australia, 2017). Continuous noise, which is identified as ‘chronic noise’ within the plan, is considered a threat to marine turtles as it may lead to avoidance of important habitats.

The Operational Area overlaps the internesting buffer for the flatback turtle which extend 60 km seawards from the nesting locations at the Dampier Archipelago, including Delambre Island and Hauy Island (Table 3-6). The continuous noise exposure is expected to only overlap a comparatively small portion, approximately 0.5%, of the flatback turtle internesting buffer (Figure 3-11).

The closest nesting locations to the Operational Area are the significant rookeries located on Barrow Island (DSEWPaC, 2012a), Montebello Islands, Thevenard Island, Varanus Island, Lowendal Islands, King Sound and Dampier Archipelago (Pendoley, 2005; Limpus, 2007; Pendoley Environmental, 2011), which are located at least 40 km away. Given the Operational Area is over 40 km from the nearest turtle nesting beach, it is expected that only transient individuals, opportunistically foraging, or the few individuals transiting to nesting beaches are expected to be within the Operational Area.

Temporary and localised avoidance behaviours to individual marine turtles within the Operational Area are not expected to result in population or ecosystem level affects. Furthermore, the Recovery Plan for Marine Turtles in Australia states that potential behavioural changes to individual marine turtles are not expected to impact turtle populations (DEE, 2017a). As such, any impact will be short-term, with impacts temporary and localised.

Injury/Mortality

To account for the new thresholds for PTS and TTS (Accomando et al., 2025), and scientific uncertainty with regards to using previous injury thresholds (Finneran et al., 2017), the assessment has conservatively adopted the strategy to use the noise threshold criteria for LF cetaceans as discussed in Section 5.3.3.1. As such, the greatest modelled distance from noise modelling by Wecker et al. (2022) predicted:

- 24h TTS criteria was reached within 2.66 km
- 24h PTS criteria was reached within 0.13 km.

Given the Operational Area is over 40 km from the nearest turtle nesting beach, as discussed previously, it is expected that only transient individuals, opportunistically foraging, or the few individuals transiting to nesting beaches are expected to be within the Operational Area.

The onset of TTS and PTS requires chronic exposure (over 24 hours). Transient individual marine turtles are not expected to remain within 2.66 km and 130 m of a continuous sound source for 24 hours for the onset of TTS and PTS to occur. Given the short duration (i.e. ~15-20 days per well) and the localised extent of potential injury / mortality (e.g. a maximum distance of 2.66 km and 130 m of a continuous sound source for 24 hours for the onset of TTS and PTS to occur), the consequence of, injury/mortality to marine reptiles from continuous noise emissions associated with the exploration drilling activities has been evaluated to potentially result in localised short-term impacts to individuals of conservation value, however, not affect local ecosystem or population functioning.

Marine Mammals

Several species of marine mammals may be present within the Operational Area and surrounds (Section 3.4.3.5). No breeding, foraging or calving areas for EPBC Act listed marine mammals were identified within the Operational Area.

A Migration BIA for the humpback whale was the only BIA identified to overlap the Operational Area (Section 3.4.3.5).

Change in Behaviour

Marine mammals are sensitive to noise in the marine environment. Their use of sound for communication, prey capture, predator avoidance, navigation and their physiological features (i.e. large gas-filled organs) make them vulnerable to both disturbance and physiological damage from underwater noise of sufficient magnitude.

Continuous underwater noise may interfere with the ability of marine animals to detect natural sounds. This effect is termed ‘auditory masking’ and has the potential to interfere with animals’ communication and socialisation, the detection of predators and prey, and navigation and orientation. For masking to occur, the noise must be loud enough and have a similar frequency to the communication signal, and both must occur at the same time. Therefore, the probability of masking increases with decreasing distance to the noise source due to the higher levels overlap of the vocalisations frequencies. Clark et al. (2009) classified the potential for masking and communication impacts as high near the vessel (within tens of metres), moderate within

hundreds, and low within thousands of metres. Therefore, impacts of masking will be highly localised.

Behavioural responses to noise emissions by marine mammals, such as cetaceans are generally highly variable, and dependant on the context and individual. A wide range of behavioural responses to anthropogenic noise emissions have been observed, including avoidance, altered swimming direction, increased swimming speed, 'startle' reactions, and alteration to surfacing, breathing and diving patterns (Erbe et al., 2019). Vessel noise has also been shown to reduce foraging efficiency for specific species, such as sperm whales (Erbe et al., 2019).

Table 5-12 shows the marine mammal behavioural threshold (NMFS, 2024) was reached for noise modelling conducted by Stroot et al. (2022), Wecker et al. (2022) and Warren et al. (2023). Wecker et al. (2022) predicted the greatest modelled distance to the marine mammal behavioural threshold of 20.7 km from the continuous sound sources, based on a scenario of sound sources including three vessels under DP and drilling operations. This scenario, where a third support vessel may be used to provide additional logistical support, is not considered typical for the activity. Two support vessels supporting the MODU drilling is the expected typical scenario, as represented by Stroot et al. (2022) which predicted the marine mammal behavioural threshold to be reached within 8.85 km of the sound sources.

As a conservative approach, behavioural impacts to continuous noise emissions may occur within ~21 km of the exploration drilling activities. This continuous noise exposure is expected to overlap only a comparatively small portion of the Migration BIA for the humpback whale (Figure 3-10), and there is no recovery plan or conservation advice associated with this BIA. Considering there are no regionally significant feeding, breeding or aggregation areas for marine mammals in the Operational Area, change in behaviour impacts are likely to be limited to transient individuals only.

Given the short duration (i.e. ~15-20 days per well), the localised extent of potential behavioural changes (e.g. a maximum distance of <21 km), the lack of habitat critical to the survival of the species, the consequence has been evaluated to potentially result in localised short-term impacts to individuals of conservation value, however, not affect local ecosystem or population functioning.

Injury/Mortality

Literature provides quantitative TTS and PTS SEL_{24h} thresholds for assessing auditory impairment in marine mammals. TTS and PTS SEL_{24h} thresholds is a cumulative metric that requires a receptor to be consistently exposed at this noise effect criteria for a 24-hour period for injury to occur.

Table 5-12 shows TTS and PTS SEL_{24h} threshold criteria for marine mammals were reached for noise modelling conducted by Stroot et al. (2022), Wecker et al. (2022) and Warren et al. (2023). The greatest modelled distances to marine mammal TTS and PTS thresholds were based on noise modelling by Wecker et al. (2022) and Warren et al. (2023) which predicted:

- TTS:
  - LF cetaceans - within 2.66 km (Wecker et al., 2022)
  - HF cetaceans - within 0.16 km (Warren et al., 2023)

  - VHF cetaceans - within 3.33 km (Warren et al., 2023).
- PTS:
  - LF cetaceans - within 0.13 km (Wecker et al., 2022)
  - HF cetaceans - within 0.09 km (Wecker et al., 2022)
  - VHF cetaceans - within 0.21 km (Warren et al., 2023).

To account for the new thresholds for auditory injury and TTS (NMFS, 2024) (Section 5.3.3.1), and scientific uncertainty with regards to using previous injury thresholds (Koessler and McPherson, 2020), the range to behavioural change threshold will also conservatively consider the potential for auditory injury and TTS, i.e. behavioural change, auditory injury and TTS to occur within <21 km of the sound source.

The potential of injury (TTS and PTS) to marine mammals during exploration drilling activities requires an individual to be consistently exposed to vessel/MODU/drilling operations for a 24-hour period for injury to occur. As a very conservative approach, marine mammals are required to remain within 21 km of a vessel/MODU for at least a 24-hour period for injury to occur.

The area within a 21 km buffer of the Operational Area overlaps a comparatively small portion of the Migration BIA for the humpback whale (Figure 3-10), and there is no recovery plan or conservation advice associated with this BIA. Considering there are no regionally significant feeding, breeding or aggregation areas for marine mammals in the Operational Area, potential injury to marine mammals are limited to transient individuals only.

The area within the 21 km buffer of the Operational Area does not contain habitats that encourages high-site fidelity for marine mammals given the area does not overlap reproduction, known foraging area, foraging annual high use area BIAs for marine mammals. Marine mammals in this area are not expected to remain for extended periods and are expected to transit through.

Given the short duration of continuous underwater sound emissions (~15-20 days per well), the limited spatial area (within a 21 km buffer of the Operational Area) where injury may occur, and that marine mammals within this area are expected to transit through and not remain in the area for extended periods, potential injury to marine mammals from continuous underwater sound is not credible and not considered further.

5.3.5 Risk Ranking

Continuous noise emissions are expected to be limited to highly localised and short-term change in behaviour to marine fauna, such as temporary displacement from the immediate vicinity of the noise source. Due to the transient nature of most marine fauna found with the Operational Area, the absence of significant feeding, breeding or aggregation areas for marine fauna, and the short duration of continuous noise emissions, impacts are expected to be localised and short-term impact to few transient individuals of conservation value, however, not affect local ecosystem or population functioning. Therefore:

- The consequence ranking of ‘1’ (Incidental) was assigned to fish, sharks and rays, marine reptiles and marine mammals, and a likelihood of ‘E’ (Almost Certain) was considered appropriate, resulting in a risk ranking of ‘Medium’ (RRIII).

5.3.6 ALARP Demonstration

Table 5-13: Demonstration of ALARP – Continuous noise emissions

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-
Prevention			
None identified	-	-	-
Reduction			
MODU and vessel engines and power generation equipment maintained to optimise smooth running.	EPO-ED-03	All MODU and vessel engines and power generation equipment shall be serviced in accordance with the relevant Contractor's PMS to limit excessive noise generation.	VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.
Vessels operating in the Operational Area must adhere to Part 8 of EPBC Regulation 2000 to minimise exposure of marine fauna to noise impacts.	EPO-ED-03	Compliance with EPBC Regulations 2000 – Part 8 Division 8.1 (Regulation 8.05 and 8.06) which requires that: • A vessel will not travel greater than 6 knots within 300 m of a whale (caution zone) and not approach closer than 100 m from a whale. • A vessel will not approach closer than 50 m of a dolphin or 100 m of a whale. • A vessel will not approach closer than 300 m to a calf (whale or dolphin) (the caution zone). • If a calf appears in the caution zone the vessel must be immediately stopped and must: o Turn off the vessel's engines, or disengage the gears, or withdraw the vessel from the caution zone at a constant speed of less than 6 knots.	Records demonstrate no breaches of EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans.

Mitigation			
None identified	-	-	-
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
Implementation of shut-down procedures during exploration drilling activities if marine mammals are spotted within close distances of vessels or the MODU.	Any localised, short-term change in behaviour to marine mammals caused by vessel operations and drilling activities would not affect feeding, breeding or aggregation activities. Individuals could easily move away from the noise source. These controls would not reduce environmental impact effectively and would be burdensome to implement, extending the activity timeframes.		Not adopted.
Implementation of shut-down procedures for humpback whales if exploration drilling activities are undertaken during migration season.	Any localised, short-term change in behaviour to humpback whales caused by the exploration drilling activities would not affect feeding, breeding or aggregation activities. Individuals could easily move away from the noise source. These controls would not reduce environmental impact effectively and would be burdensome to implement, extending the activity timeframes.		Not adopted.
Implementation of pre-start visual observations for whales.	Any localised, short-term change in behaviour to whales caused by the exploration drilling activities would not affect feeding, breeding or aggregation activities. Individuals could easily move away from the noise source. This control would reduce the likelihood of individuals being within proximity of the acoustic source. However, as the potential impact to whales is already limited, the benefits of this control are not significant.		Not adopted.
Adopt newly updated NMFS (2024) marine mammal thresholds.	Adopting the newly updated NMFS (2024) marine mammal thresholds would include re-running the underwater noise modelling, and using the new modelling results to update the impact assessment where required. VOGA anticipates that distances to impact threshold will increase using the newly published thresholds, however, a conservative estimate has already been applied to the impact assessment by using the noise criteria thresholds for behavioural impacts (Section 5.3.4.1). There are no regionally significant feeding, breeding or aggregation areas for marine mammals in the Operational Area. Overlap with existing migration BIA may change, however, the overlap would still be a small fraction of the area. As such, the consequence is not expected to change as a result of adopting the new thresholds.		Not adopted.

	Considerable time and cost would be required to re-run the modelling, which is disproportionate to the potential gains given that a highly conservative approach has already been adopted in the impact assessment and no change to consequence is expected as a result of revised modelling results.	
Adopt Accomando et al. (2025) marine turtle thresholds.	Adopting the Accomando et al. (2025) marine turtle thresholds would include re-running the underwater noise modelling and using the new modelling results to update the impact assessment where required. VOGA anticipates that distances to impact threshold will increase using the newly published thresholds, however, a conservative estimate has already been applied to the impact assessment by using the criteria thresholds for LF cetaceans (Section 5.3.4.1). Although the Operational Area overlaps with a small portion (0.5%) of the internesting buffer for flatback turtles, by taking a conservative approach to the impact assessment VOGA does not expect that revised modelling would result in a change in consequence. The Operational Area does not overlap with any other habitats critical to the survival of marine turtle species. As such, the consequence is not expected to change as a result of adopting the new thresholds. Considerable time and cost would be required to re-run the modelling, which is disproportionate to the potential gains given that a highly conservative approach has already been adopted in the impact assessment and no change to consequence is expected as a result of revised modelling results.	Not adopted.
ALARP Summary: The impacts of continuous noise emissions are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-3), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.		

5.3.7 Acceptability Demonstration

Table 5-14: Acceptability demonstration – Continuous noise emissions

ACCEPTABLE LEVEL OF RISK DEMONSTRATED	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-13).
External context – objections or claims considered	N/A – no external objections or claims received.

Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes – including: • Vessels comply with Part 8 of EPBC Regulations 2000 • Approved Conservation Advice for *Balaenoptera borealis* (Sei Whale) (TSSC, 2015c) • Approved Conservation Advice for *Balaenoptera physalus* (Fin Whale) (TSSC, 2015d) • Conservation Management Plan for the Blue Whale, 2015-2025 (DoE, 2015) • Conservation Advice for *Orcaella heinsohni* (Australian snubfin dolphin) (DCCEEW, 2025b) • Conservation Advice for *Sousa sahulensis* (Australian humpback dolphin) (DCCEEW, 2025c) • National Recovery Plan for the Southern Right Whale (*Eubalaena australis*) (DCCEEW, 2024o) • Recovery plan for the Australian Sea Lion (*Neophoca cinereal*) (DSEWPC, 2013) • Recovery Plan for Marine Turtles in Australia, 2017-2027 (Commonwealth of Australia, 2017) • Approved Conservation Advice for *Dermochelys coriacea* (Leatherback Turtle) (DEWHA, 2008c).
RR < High (RRII)	Yes – Medium (RRIII).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-03 See Section 7 for further details.
Acceptability Summary The impacts of continuous noise emissions have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-13), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.4 Planned: Noise Emissions - Impulsive

5.4.1 Hazard Report

Table 5-15: Hazard Report – Impulsive noise emissions

HAZARD	Noise emissions – impulsive
EP risk number	EP-ED-R04
Activity/cause	Vertical seismic profiling
Extent	The maximum predicted range for exceeding marine fauna impact thresholds was 3.2 km from a VSP sound source for the low-frequency cetacean TTS threshold (Wecker et al., 2022).

Potential impact description	Masking or interfering with biologically important sounds. Change in fauna behaviour leading to disturbance or displacement of fauna. Injury/mortality to fish eggs and larvae. *Note: The risk rankings below relate to change in marine fauna behaviour (leading to disturbance, or displacement and including masking) and injury/mortality to fish eggs and larvae only. The potential for temporary or permanent injury to adult marine fauna is not credible as evaluated in Section 5.4.4.*		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Benthic invertebrates	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Fish, sharks and rays	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Marine reptiles	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Marine mammals	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Relevant EPO(s)	EPO-ED-03 Impacts to marine fauna from noise emissions will be limited to temporary behavioural change localised to the noise source, with no species population-level impacts.		

5.4.2 Description of Hazard

During the exploration drilling activities, impulsive noise emissions may be generated during formation evaluation operations which may include VSP.

VSP uses hydrophones in a borehole and a near-surface seismic source, a small airgun array, to gather data for formation evaluation. The small airgun rapidly releases compressed air into the water column creating an oscillating bubble. The air bubble rapidly expands and collapses which generates impulsive underwater sound. A VSP 750 in^3 airgun array located at a water depth of 5 m is expected to have a peak sound source level of around 239 dB re 1 µPa m (Warren et al., 2023).

5.4.3 Noise Modelling

The modelling study conducted by JASCO for Chevron drilling operations on the Continental Shelf of the NWS (Warren et al., 2023) was identified as a suitable analogue because the sound speed profiles and geo-acoustics of that study are representative of the conditions for the potential VSP operations in the Operational Area.

The marine mammal injury thresholds used in Warren et al. (2023), which were based on NMFS (2018), have been superseded by more recent, conservative thresholds (NMFS, 2024). Despite this change, the low levels of impulsive noise anticipated from the proposed activity, coupled with the previously established limited impact ranges, make it improbable that the new thresholds would lead to substantial impact distances, thus maintaining an acceptable level of risk on sensitive marine fauna within or near the Operational Area.

Warren et al. (2023) VSP Site A, located on the Continental Shelf in a water depth of 142.6 m, was used in this assessment.

5.4.3.1 Noise Effect Criteria and Results

The following impulsive noise effect thresholds used in the risk assessment were selected as they have been accepted by regulatory agencies and represent the best available science at the time of modelling, such as:

- Frequency-weighted accumulated sound exposure levels (SEL_{24h}) from Southall et al. (2019) for the onset of PTS and TTS in marine mammals
- Un-weighted SPL for behavioural threshold for marine mammals based on NMFS (2024)
- Sound exposure guidelines for fish, fish eggs, and larvae (Popper et al., 2014)
- Un-weighted SPL for behavioural response and disturbance for sea turtles from McCauley et al. (2000)
- Frequency-weighted accumulated sound exposure levels (SEL_{24h}) from Finneran et al. (2017) for the onset of PTS and TTS in marine turtles
- No effect for crustaceans PK-PK sound level of 202 dB re 1 µPa (Payne et al., 2008).

As discussed in Section 5.3.3.1, new, more conservative thresholds for auditory injury (which includes PTS[4]) and TTS to marine mammals have recently been published by NMFS (2024). VOGA anticipates that the updated auditory weighting functions, exposure function parameters, and received level thresholds for auditory injury and TTS may result in larger predicted spatial areas of auditory injury and TTS to marine mammal hearing groups. See the further assessment and details provided in Section 5.4.4.1.

As discussed within Section 5.3.3.1, Accomando et al. (2025) has suggested updates to the underwater sound exposure thresholds for marine turtles. . To account for the scientific uncertainty, VOGA have chosen to take a highly conservative and precautionary approach and use the PTS and TTS thresholds for LF cetaceans as a proxy for the potential PTS and TTS for marine turtles within the impact assessment within Section 5.4.4.1. See the further assessment provided in Section 5.4.4.1.

Current available literature on sound exposure impacts to marine invertebrates from underwater sound is limited and inconclusive and is not discussed further in this section.

There are no thresholds for underwater sound impacts to either seabirds or shorebirds. Therefore the impacts to birds has not been assessed further.

[4] The updated technical guidance (NMFS, 2024) details the inclusion of the term “auditory injury (AUD INJ)” to replace “PTS”. AUD INJ is defined as ‘damage to the inner ear that can result in destruction of tissue, such as the loss of cochlear neuron synapses or auditory neuropathy. Auditory injury may or may not result in a permanent threshold shift (PTS)’ (NMFS, 2024). Given the new, more conservative threshold for AUD INJ has not been incorporated into the impact assessment within this EP, the use of AUD INJ instead of PTS has been deemed as inappropriate for the level of assessment within this EP. As such, the term “PTS” has been used throughout.

A summary of the noise effect criteria used in the impact assessment for fish, marine reptiles and marine mammals and the relevant literature is provided in Warren et al. (2023) and below in Table 5-9 to Table 5-11.

Table 5-16: Impulsive noise criteria threshold for fish

Receptor	Behaviour	Mortality and potential mortal injury	Impairment		
			Recoverable injury	TTS	Masking
Fish: No swim bladder (particle motion detection)	(N) High (I) Moderate (F) Low	> 219 dB SEL_{24h} or > 213 dB PK	> 216 dB SEL_{24h} or > 213 dB PK	>> 186 dB SEL_{24h}	Seismic: (N, I, F) Low
Fish: Swim bladder not involved in hearing (particle motion detection)	(N) High (I) Moderate (F) Low	210 dB SEL_{24h} or > 207 dB PK	203 dB SEL_{24h} or > 207 dB PK	>> 186 dB SEL_{24h}	Seismic: (N, I, F) Low
Fish: Swim bladder involved in hearing (primarily pressure detection)	(N, I) High (F) Moderate	207 dB SEL_{24h} or > 207 dB PK	203 dB SEL_{24h} or > 207 dB PK	186 dB SEL_{24h}	Seismic: (N, I) Low (F) Moderate
Fish eggs and fish larvae	(N) Moderate (I, F) Low	> 210 dB SEL_{24h} or > 207 dB PK	(N) Moderate (I) Low (F) Low	(N) Moderate (I) Low (F) Low	Seismic: (N, I, F) Low

Source: Popper et al. (2014)
Note: Relative risk (high, moderate, low) is given for animals at three distances from the source defined in relative terms as near (N), intermediate (I), and far (F).

Table 5-17: Impulsive noise criteria threshold for marine turtles

Receptor	Behavioural Response SPL (Lp; dB re 1 µPa)	Behavioural Disturbance SPL (Lp; dB re 1 µPa)	Finneran et al. (2017)		Accomando et al. (2025)	
			PTS	TTS	PTS	TTS
			Weighted SEL_{24h} (LE,24h; dB re 1µPa^2s)		Weighted SEL_{24h} (LE,24h; dB re 1µPa^2s)	
Marine turtle	166	175	204	189	169	184

Source: McCauley et al. (2000); Finneran et al. (2017); Accomando et al. (2025)

Table 5-18: Impulsive noise criteria threshold for marine mammals

Receptor	Hearing group	Behavioural	NMFS (2018)		NMFS (2024)	
			PTS	TTS	AUD INJ	TTS
		SPL (L^p; dB re 1µPa)	Weighted SEL_{24h} (L_E,24h; dB re 1µPa^{2}s)		Weighted SEL24h (L_E,24h; dB re 1µPa2s	
Marine mammals	Low-frequency (LF) cetaceans	160	183	168	183	168
	High-frequency (HF) cetaceans		185	170	193	178
	Very High-frequency (VHF) cetaceans		155	140	159	144

Source: NMFS (2018; 2024); Southall et al. (2019)
Note: Lp denotes sound pressure level period and has a reference value of 1 µPa.
LE denotes cumulative sound exposure over a 24h period and has a reference value of 1 µPa^{2}s.

Table 5-19: Distances to PTS, TTS and behaviour effects from impulsive noise from VSP operations on the North West Shelf (Warren et al., 2023)

Hearing Group	Noise Effect Criteria	Maximum Rmax Distance (km)	Reference
Fishes: (swim bladder): recoverable injury	203 dB SEL_{24h}	0.05	Popper et al. (2014)
Fish eggs, and larvae: injury	207 dB PK	0.05	Popper et al. (2014)
Fishes: (swim bladder and no swim bladder): TTS	186 SEL_{24h}	0.57	Popper et al. (2014)
Benthic invertebrates: no effects	202 dB PK-PK	0.06	Payne et al. (2008)
Turtle: behavioural response	166 dB SPL	1.03	McCauley et al. (2000)
Turtle: Behavioural disturbance	175 dB SPL	0.27	McCauley et al. (2000)
Marine mammals: behavioural	160 dB SPL	2.28	NMFS (2024)
Low-frequency cetaceans: PTS (humpback and pygmy blue whales)	183 dB SEL_{24h}	0.48	Southall et al. (2019)
Low-frequency cetaceans: TTS (humpback and pygmy blue whales)	168 dB SEL_{24h}	3.20	Southall et al. (2019)
High-frequency cetaceans: PTS (dolphins, beaked whales, sperm whales)	185 dB SEL_{24h}	Not reached	Southall et al. (2019)

Hearing Group	Noise Effect Criteria	Maximum Rmax Distance (km)	Reference
High-frequency cetaceans: TTS (dolphins, beaked whales, sperm whales)	170 dB SEL_{24h}	Not reached	Southall et al. (2019)
Very High-frequency cetaceans: PTS (pygmy and dwarf sperm whales)	202 dB PK	0.06	Southall et al. (2019)
Very High-frequency cetaceans: TTS (pygmy and dwarf sperm whales)	196 dB PK	0.13	Southall et al. (2019)

5.4.4 Impact and Risk Evaluation

Potential impacts caused by impulsive underwater noise include:

- Change in fauna behaviour, including:
  - masking - interfering with other biologically important sounds, including vocal communication, echolocation, signals, and sounds produced by predators or prey.
- Injury/mortality to marine fauna, such as:
  - recoverable injury
  - mortality or potential mortal injuries
  - TTS
  - PTS.

Potential receptors that may be impacted are:

- Benthic invertebrates
- Fish, sharks and rays (including eggs and larvae)
- Marine reptiles
- Marine mammals.

5.4.4.1 Impact Assessment

Benthic Invertebrates

Carroll et al. (2017) and Edmonds et al. (2016) provide comprehensive reviews of seismic noise impacts on invertebrates, highlighting particle motion as a key factor for crustacean and bivalve hearing. Due to the absence of specific noise effect criteria for invertebrates, Day et al. (2016) on southern rock lobsters (*Jasus edwardsii*) is often cited. This study observed sub-lethal effects, including impaired reflexes, statocyst damage, and reduced haemocyte counts, at peak-peak pressure levels of 209–212 dB re 1 µPa. Conversely, Payne et al. (2007) found no significant effects on American lobsters (*Homarus americanus*) at 202 dB re 1 µPa (PK-PK), except for a possible calcium reduction. Therefore, 202 dB re 1 µPa (PK-PK) is applied as a no-effect criterion.

Warren et al. (2023) predicted the benthic invertebrate no-effect criterion to be reached from 60 m of the VSP sound source. Any potential effects are expected to be within the Operational

Area where the presence of benthic invertebrates are depauperate. Potential impacts to benthic invertebrates are expected to be limited to the low numbers of species and low abundance of infaunal communities as found during baseline surveys in the Operational Area that are comparable to communities highly represented throughout the NWS (Section 3.4.3.2).

Marine invertebrate behavioural reflexes are possible in the Operational Area during VSP operations, but impacts are expected to be limited to within 60 m of the VSP sound source and not significant. Noise modelling predicts no effects outside this range, therefore behavioural impacts are expected to be highly localised and temporary to low numbers of benthic invertebrate species highly represented throughout the region, and population-level behavioural effects are unlikely.

Fish, Sharks, and Rays

Several species of fish, sharks, and rays may be present within the Operational Area and surrounds. Many species of fish, sharks, and rays are expected to be transient individuals due to the absence of critical habitats found within the Operational Area (Section 3.4.1). A Foraging BIA for the whale shark is overlapped by the Operational Area (Section 3.4.4).

Change in Behaviour

Research on free-ranging fish responses to impulsive noise is limited (Carroll et al., 2017). Wardle et al. (2001) observed startle responses but no avoidance in reef fish exposed to impulsive noise. Caged fish studies show startle and alarm responses (Carroll et al., 2017; Fewtrell and McCauley, 2012). Popper et al. (2014) suggests behavioural responses are likely within hundreds of metres. Therefore, fish behavioural responses (startle and avoidance) are expected to be confined to the Operational Area during VSP operations.

The Operational Area lacks habitats for site-attached EPBC Act-listed fish, limiting potential impacts to transiting individuals. However the Operational Area overlaps a foraging BIA for the whale shark. Whale sharks are found year-round in the wider NWS, not just during their peak aggregation in April and May at Ningaloo's foraging BIA. Temporary and localised behavioural changes to whale sharks may occur within the Operational Area, these changes are not expected to result in ecologically significant impacts at a population level.

Due to the intermittent, short-term nature of VSP operations, the limited area of potential behavioural responses in fish, sharks and rays (within hundreds of metres of the VSP sound source), and the lack of aggregation or site-attached fish habitats, population-level behavioural effects are unlikely.

Injury/Mortality

Popper et al. (2014) established quantitative criteria for three immediate effects of impulsive sound on fish: mortality (including fatal injury), recoverable injury (e.g. hair cell damage), and temporary threshold shift (TTS). Table 5-19 presents these criteria and the modelled distances at which they may be reached for fish with and without swim bladders. Key findings include:

- Mortality/fatal injury criterion was predicted within 50 m for fish eggs and larvae
- Recoverable injury criterion was predicted within 50 m for fish with swim bladders

- TTS criteria for fish with and without swim bladders was predicted within 570 m.

The potential for recoverable injury and TTS to fish, sharks and rays is confined to the Operational Area, within 570 m of the VSP sound source. Research has not demonstrated mortality of fish, sharks and rays from impulsive noise given prolonged or extreme exposure to high-intensity, low-frequency sound is required for physical damage to occur (Carroll et al., 2017). The intermittent, short-term nature of VSP operations and the lack of aggregation or site-attached habitats for fish, sharks and rays will prevent prolonged exposure and therefore the onset of injury/mortality to fish, sharks and rays.

The potential for injury/mortality is expected to be limited to fish eggs and larvae in areas confined within the Operational Area, i.e. 50 m from the sound source. The area of potential injury/mortality to fish eggs and larvae is highly localised and due to low levels of planktonic productivity expected within the Operational Area (Section 3.4.3.1), fish egg and larvae populations are not expected to be impacted by impulsive underwater noise. On this basis, the impacts to fish eggs and larvae from impulsive underwater noise during VSP operations will be slight and short-term.

Due to the intermittent, short-term nature of VSP operations, the limited area of potential injury/mortality to fish eggs and larvae (within 50 m of the VSP sound source), and the low levels of planktonic productivity in the Operational Area, population-level effects are unlikely.

Marine Reptiles

Several species of marine turtles may be present within the Operational Area and surrounds; however, the internesting BIA buffer for the flatback turtle was the only BIA identified to overlap the Operational Area (Section 3.4.3.6).

Change in Behaviour

This assessment used McCauley et al. (2000) behavioural response criteria for turtles exposed to impulsive sound. Table 5-19 shows these criteria and modelled impact distances. Behavioural responses were predicted at maximum distance of 1.03 km from the VSP sound source. Therefore, turtle behavioural responses are expected to be limited to the Operational Area during VSP.

Several species of marine turtles may be present within the Operational Area and surrounds; however, the Internesting BIA buffer for the flatback turtle was the only BIA identified to overlap the Operational Area (Section 3.4.3.6).

Due to the intermittent, short-term nature of VSP operations, the limited area of potential behavioural responses (within 1.03 km from the VSP sound source), and the distance to the closest nesting locations, being at least 40 km away from the Operational Area, potential behavioural effects to marine turtles will be short-term, with impacts temporary and localised and unlikely to result in population level effects.

Injury/Mortality

To account for the new thresholds for PTS and TTS (Accomando et al., 2025), and scientific uncertainty with regards to using previous injury thresholds (Finneran et al., 2017), the

assessment has conservatively adopted the strategy to use the noise threshold criteria for LF cetaceans as discussed in Section 5.4.3.1. As such, the greatest modelled distance from noise modelling by Wecker et al. (2022) predicted:

- 24h TTS criteria was reached within 3.20 km
- 24h PTS criteria was reached within 0.48 km.

Given the Operational Area is over 40 km from the nearest turtle nesting beach, as discussed previously, it is expected that only transient individuals, opportunistically foraging, or the few individuals transiting to nesting beaches are expected to be within the Operational Area.

The onset of TTS and PTS requires chronic exposure (over 24 hours). Transient individual marine turtles are not expected to remain within 3.20 km and 480 m of the VSP sound source for 24 hours for the onset of TTS and PTS to occur. Therefore, injury/mortality to marine reptiles from impulsive noise emissions associated with the exploration drilling activities are expected to be short-term, with impacts temporary and localised and unlikely to result in population level effects.

Marine Mammals

Several species of marine mammals may be present within the Operational Area and surrounds (Section 3.4.3.5). No breeding, foraging or calving areas for EPBC Act listed marine mammals were identified within the Operational Area.

A Migration BIA for the humpback whale was the only BIA identified to overlap the Operational Area (Section 3.4.3.5).

Change in Behaviour

The United States National Marine Fisheries Service (NMFS, 2024) acoustic threshold for behavioural effects in marine mammals was used in this assessment. The acoustic threshold for behavioural effects in marine mammals is predicted at a maximum of 2.28 km from the VSP sound source. As a result, behavioural effects to marine mammals are expected to be in proximity to the Operational Area during VSP operations.

The Operational Area overlaps a comparatively small portion of the Migration BIA for the humpback whale (Figure 3-10), and there is no recovery plan or conservation advice associated with this BIA. Considering there are no regionally significant feeding, breeding or aggregation areas for marine mammals in the Operational Area, change in behaviour impacts are likely to be limited to transient individuals only.

Due to the intermittent, short-term nature of VSP operations, the limited area of potential behavioural responses (within 2.28 km from the VSP sound source), and the absence of feeding, breeding or aggregation areas for marine mammals within the Operational Area, potential behavioural effects to marine mammals will be short-term, with impacts temporary and localised and unlikely to result in population level effects.

Injury/Mortality

Literature provides quantitative TTS and PTS SEL_{24h} thresholds for assessing auditory impairment in marine mammals. TTS and PTS SEL_{24h} thresholds is a cumulative metric that requires a receptor to be consistently exposed at this noise effect criteria for a 24-hour period for injury to occur.

Table 5-19 shows TTS and PTS SEL_{24h} threshold criteria for marine mammals and modelled impact distances. In summary Warren et al. (2023) predicted:

- TTS:
  - LF cetaceans – within 3.20 km
  - HF cetaceans – TTS criterion was not reached
  - VHF cetaceans – within 0.13 km
- PTS:
  - LF cetaceans – within 0.48 km
  - HF cetaceans – PTS criterion was not reached
  - VHF cetaceans – within 0.06 km.

As discussed above in Section 5.3.3.1 and 5.4.3.1, new, more conservative thresholds for auditory injury (which includes PTS) and TTS to marine mammals have recently been published by NMFS (2024). Given the very short distances reached by the previous injury thresholds (PTS and TTS) , any potential increase to the extent using the new thresholds are not expected to result in significant changes to the consequence. However, to account for any scientific uncertainty that the new sounds exposure thresholds for marine mammals may have on the noise effect criteria, VOGA have chosen to conservatively double the SEL_{24h} threshold criteria for cetaceans for the impact assessment in this EP.

The potential of injury (TTS and PTS) to marine mammals during exploration drilling activities requires an individual to be consistently exposed to VSP operations for a 24-hour period for injury to occur. As a conservative approach, marine mammals are required to remain within 6.4 km of VSP operations for at least a 24-hour period for injury to occur.

The area within 6.4 km of the VSP sound source overlaps a comparatively small portion of the Migration BIA for the humpback whale (Figure 3-10), and there is no recovery plan or conservation advice associated with this BIA. Considering there are no regionally significant feeding, breeding or aggregation areas for marine mammals in the Operational Area, potential injury to marine mammals are limited to transient individuals only.

The area within 6.4 km of the VSP sound source does not contain habitats that encourages high-site fidelity for marine mammals given the area does not overlap reproduction, known foraging area, foraging annual high use area BIAs for marine mammals. Marine mammals in this area are not expected to remain for extended periods and are expected to transit through.

Furthermore, due to the nature and scale of the activity, the noise exposure extents are expected to only intersect with one BIA for marine mammals; a humpback whale Migration BIA, which has no associated recovery plan or conservation advice (Figure 3-10). Considering there are no regionally significant feeding, breeding or aggregation areas for marine mammals in the

Operational Area, impacts are anticipated to be low and likely to be limited to transient individuals only.

Due to the intermittent, short-term nature of VSP operations, the limited spatial area (within a 6.4 km of the VSP sound source) where injury may occur, and that marine mammals within this area are expected to transit through and not remain in the area for extended periods, potential injury to marine mammals from impulsive underwater sound is not credible and not considered further.

5.4.5 Risk Ranking

Impulsive noise emissions are expected to be limited to highly localised and short-term change in behaviour to marine fauna, such as temporary displacement from the immediate vicinity of the VSP sound source. Due to the transient nature of most marine fauna found with the Operational Area, the absence of significant feeding, breeding or aggregation areas for marine fauna, and the short duration of VSP operations, impacts are expected to be localised and short-term impact to few transient individuals of conservation value, however, not affect local ecosystem or population functioning.

The potential for injury/mortality is limited to low levels of fish eggs and larvae in the Operational Area where population-level effects are unlikely.

In summary:

- The consequence ranking of '1' (Incidental) was assigned to benthic invertebrates, fish, sharks and rays, marine reptiles and marine mammals, and a likelihood of 'E' (Almost Certain) was considered appropriate, resulting in a risk ranking of 'Medium' (RRIII).

5.4.6 ALARP Demonstration

Table 5-20: Demonstration of ALARP – Impulsive noise emissions

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-
Prevention			
None identified	-	-	-
Reduction			
EPBC Act Policy Statement 2.1 – Interaction between Offshore Seismic Exploration and Whales: Industry Guidelines.	EPO-ED-03	VSP operations will implement precaution zones and management procedures during daylight hours, where practicable: Precaution zones based on modelling results where Rmax for low power zone assessment criteria	Records demonstrate no breaches of EPBC Act Policy Statement 2.1 – Interaction between Offshore Seismic Exploration

		is within 1 km of source (Warren et al., 2023): • Observation zone: 3 km horizontal radius from the acoustic source. • Low power zone: 2 km horizontal radius from the acoustic source. • Shut-down zone: 500 m horizontal radius from the acoustic source. Following management procedures during daylight hours: • Pre start-up visual observation • Soft start • Start-up delay • Operations • Power-down and stop work.	and Whales: Industry Guidelines.
Mitigation			
None identified	-	-	-
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
Dedicated Marine Mammal Observer (MMO) (as per EPBC Act Policy Statement 2.1 – Part B.1).	Any localised, short-term change in behaviour to marine mammals caused by VSP operations would not affect feeding, breeding or aggregation activities. Support vessel bridge crews will maintain a constant watch during VSP operations and trained crew as MMOs will monitor for whale presence during the implementation of precaution zones and management procedures, where practicable. Additional MMOs would not further reduce the likelihood of an individual being within close proximity of the VSP sound source.		Not adopted.
Adopt newly updated NMFS (2024) marine mammal thresholds.	Adopting the newly updated NMFS (2024) marine mammal thresholds would include re-running the underwater noise modelling and using the new modelling results to update the impact assessment where required. VOGA anticipates that distances to impact threshold will increase using the newly published thresholds, however, a conservative estimate has already been applied to the impact assessment by using the noise criteria thresholds for behavioural impacts (Section 5.4.4.1). There are no regionally significant feeding, breeding or aggregation areas for marine mammals in the		Not adopted.

	Operational Area. Overlap with existing migration BIA may change, however, the overlap would still be a small fraction of the area. As such, the consequence is not expected to change as a result of adopting the new thresholds. Considerable time and cost would be required to re-run the modelling, which is disproportionate to the potential gains given that a highly conservative approach has already been adopted in the impact assessment and no change to consequence is expected as a result of revised modelling results.	
Adopt Accomando et al. (2025) marine turtle thresholds.	Adopting the Accomando et al. (2025) marine turtle thresholds would include re-running the underwater noise modelling and using the new modelling results to update the impact assessment where required. VOGA anticipates that distances to impact threshold will increase using the newly published thresholds, however, a conservative estimate has already been applied to the impact assessment by using the criteria thresholds for LF cetaceans (Section 5.4.4.1). Although the Operational Area overlaps with a small portion (0.5%) of the internesting buffer for flatback turtles, by taking a conservative approach to the impact assessment VOGA does not expect that revised modelling would result in a change in consequence. The Operational Area does not overlap with any other habitats critical to the survival of marine turtle species. As such, the consequence is not expected to change as a result of adopting the new thresholds. Considerable time and cost would be required to re-run the modelling, which is disproportionate to the potential gains given that a highly conservative approach has already been adopted in the impact assessment and no change to consequence is expected as a result of revised modelling results.	Not adopted.
ALARP Summary: The impacts of impulsive noise emissions are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-3), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.		

5.4.7 Acceptability Demonstration

Table 5-21: Acceptability demonstration – Impulsive noise emissions

ACCEPTABLE LEVEL OF RISK DEMONSTRATED	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-20).

External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes, including: • Vessels comply with EPBC Act Policy Statement 2.1 • Conservation Advice for *Balaenoptera borealis* (Sei Whale) (TSSC, 2015c) • Approved Conservation Advice for *Balaenoptera physalus* (Fin Whale) (TSSC, 2015d) • Conservation Management Plan for the Blue Whale, 2015-2025 (DoE, 2015) • Conservation Advice for *Orcaella heinsohni* (Australian snubfin dolphin) (DCCEEW, 2025b) • Conservation Advice for *Sousa sahulensis* (Australian humpback dolphin) (DCCEEW, 2025c) • National Recovery Plan for the Southern Right Whale (*Eubalaena australis*) (DCCEEW, 2024o) • Recovery plan for the Australian Sea Lion (*Neophoca cinereal*) (DSEWPC, 2013) • Recovery Plan for Marine Turtles in Australia, 2017-2027 (Commonwealth of Australia, 2017) • Approved Conservation Advice for *Dermochelys coriacea* (Leatherback Turtle) (DEWHA, 2008c).
RR < High (RRII)	Yes – Medium (RRIII)
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-03 See Section 7 for further details.
Acceptability Summary The impacts of continuous noise emissions have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-20), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.5 Planned: Atmospheric and GHG Emissions

5.5.1 Hazard Report

Table 5-22: Hazard Report – Atmospheric and GHG emissions

HAZARD	Atmospheric and GHG emissions
EP risk number	EP-ED-R05
Activity/cause	MODU operations (fuel use) Vessel operations (fuel use) Helicopter operations (fuel use) Fugitive emissions

	Refrigerants Materials (embodied carbon) Waste (end treatment)		
Extent	Drilling activities up to 119 days (estimated at 15 days for drilling and 2 days for well P&A (17 days each well), for a total of 7 wells) Vessel and MODU operations within Operational Area Atmospheric and all scopes of GHG emissions generated from the activities considered (scopes 1, 2 and 3)		
Potential impact description	A localised reduction in air quality Minor contribution to global greenhouse gases		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Ambient Air Quality	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Relevant EPO(s)	EPO-ED-04 Air emissions requirements from vessels within the Operational Area are consistent with Marine Order 97 requirements.		

5.5.2 Description of Hazard

Atmospheric emissions are gases released into the air from human and natural activities that can lead to reduction in local air quality. These emissions include non-greenhouse gases, such as nitrogen oxides (NO_x) and sulphur oxides (SO_x), and greenhouse gases (GHGs), such as carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O). The GHGs reported under the National Greenhouse and Energy Reporting (NGER) Scheme include CO_2, CH_4. N_2O, sulphur hexafluoride (SF_6), and specified kinds of hydrofluorocarbons and perfluorocarbons (CER, 2024), and are measured in the units of carbon dioxide equivalent (CO_2-e).

The activities can generate atmospheric and GHG emissions from the following sources:

- Fuel usage by MODU and vessel operations
- Fuel usage by helicopter operations
- Fugitive emissions – minor volumes of gases or vapours from the holding tanks and pressure-containing equipment
- Refrigerants used in the centralised air-conditioning system on the MODU and vessels.

Well testing (flaring) is not part of this drilling and completions activity, so is not addressed here.

5.5.3 Impact and Risk Evaluation

5.5.3.1 GHG Emissions Assessment

A GHG emissions assessment was conducted to estimate the GHG emissions generated from all planned activities that will occur within the Operational Area (Figure 2-1). The GHG emissions assessment covers all emission scopes—scopes 1, 2 and 3, defined as:

- Scope 1: The GHG emissions released as a direct result of VOGA's exploration drilling activities. In this case, scope 1 emissions will be zero as there is no gas or oil flaring expected from the activities. Fuel use by the MODU and vessels is not included in scope 1 emissions.
- Scope 2: The indirect GHG emissions from the generation of electricity, steam, heating, and cooling purchased. Scope 2 will be zero as there is no electricity/energy involved.
- Scope 3: The indirect GHG emissions from VOGA exploration drilling activities, not including scope 2, e.g. fuel use by MODU and vessels, purchased goods and services (support operations, materials).

The GHG emission sources and scope included in the assessment and relevant to the activities are summarised in Table 5-23. Emissions from fugitives and employee commuting (road travel and fixed wing aircraft) are assumed to be immaterial. There is no recovery of hydrocarbons associated with the exploration drilling activities, and as such no processing, transport, or third party end-use of hydrocarbons would occur as a result of the petroleum activity within scope of the EP and GHG emissions assessment.

Table 5-23: Emission sources and scopes included in the GHG emissions assessment

Emission scope	Exploration drilling activities
Scope 1	Immaterial fugitive emissions; no other sources
Scope 2	Not applicable
Scope 3	Support operations, including MODU, vessels[1] and helicopters Materials[2] Waste generated[3]

[1] Include vessels and MODU activities within the Operational Area only, as per the EP scope.
[2] Include embodied carbon for the major items only – cement, casing, and water-based mud (WBM).
[3] Include landfilling of the wellhead retrieved assuming immaterial emissions from waste discharge.

GHG emissions are estimated according to the methodologies in NGER Determination 2008 and GHG Protocol Corporate Value Chain (Scope 3) Standard. Assumptions and methodology used can be referred to in Appendix G.

As summarised in Table 5-24, the total GHG emissions resulting from the activities are expected to be approximately 28 kt CO_2-e, consisting of entirely scope 3 emissions.

The support operations (vessels and helicopter) are expected to generate approximately 22 kt CO_2-e, ~81% of the total GHG emissions. The vessel and helicopter emissions have included a contingency factor of 20% to account for the potential delays from the schedule and weather.

The total emissions from the activities (28 kt CO_2-e) are expected to contribute to no more than 0.0065% of the Australian carbon budget for 2026.

Table 5-24: Summary of the GHG emissions assessment results

Emission source	Total scope 3 emissions	Percentage
	kt CO_2-e	%
Drilling activities	**5.2**	**18.8**
Materials[1]	5.0	18.1
Waste[2]	2.0	0.7
Support operations	**1104**	**81.2**
Vessels[3]	22.3	80.5
Helicopter[4]	0.2	0.7
Total GHG Emissions (t CO_2-e)	**51.2**	**100**

[1] Major materials required for both well drilling and well P&A: 95 m^3 cement/well; 45 t carbon steel casing/well; and 250 m^3 WBM/well.

[2] Weight of wellhead retrieved for landfill: 140 tonnes in total.

[3] Only MODU and vessel operations within Operational Area considered; Jack-up MODU used for well drilling and P&A with 3 AHTS; Drilling and P&A durations up to a total of 119 days; and VSP with the MODU for 4 hours.

[4] Helicopter flights 7 times a week on average during drilling and P&A activities, departing from Karratha Airport.

5.5.3.2 Potential Impacts

Potential impacts caused by atmospheric and GHG emissions include:

- Localised and temporary decrease in air quality
- Minor contribution to GHGs and global climate change.

The following receptors within the Operational Area may be impacted by atmospheric and GHG emissions:

- Ambient air quality.

Given rapid dispersion of any air emissions is expected, impacts to fauna such as birds have not been evaluated.

5.5.3.3 Impact Assessment

Air Quality

Air emissions are released from vessel engines and onboard machinery. These emissions may result in a decline in local air quality within the immediate vicinity of the source.

The volume of emissions is low. Atmospheric emissions will be similar to other vessels operating in the region for both oil and gas activities and other activities.

The extent of the area of impact is predicted to be localised to the emission point as offshore winds will rapidly disperse atmospheric emission to background levels while the activities are undertaken. As the activities are in a remote location, any temporary change to air quality will not impact coastal towns.

While accidental release of ODS has the potential to contribute to ozone layer depletion, routine maintenance of refrigeration systems and controls make accidental releases rare.

Given the low volume of emissions and the offshore location of the Operational Area, biodiversity, ecological integrity and social amenity will not be impacted and any impact to air quality is negligible.

GHG emissions from the activities are expected to contribute to no more than 0.0065% of the Australian carbon budget during the activity period and are not expected to have determinable impact.

It is important to acknowledge that GHG emissions can add load to the atmosphere, which then contributes to climate change. However, climate change impacts stem from long-term global GHG emissions, minus global GHG sinks, that have accumulated in the atmosphere since the industrial revolution began and thus cannot be attributed to a specific set of activities.

5.5.4 Risk Ranking

The ambient air quality of the Operational Area is expected to be high, but emissions will rapidly disperse to background levels close to the emission source and impacts to fauna are not predicted. Therefore:

- The consequence ranking of '1' (Incidental) was assigned to air quality and contribution to GHGs, and a likelihood of 'E' (Almost Certain) was considered appropriate, resulting in a risk ranking of 'Medium' (RRIII).

5.5.5 ALARP Demonstration

Table 5-25: Demonstration of ALARP – Atmospheric and GHG emissions

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
The sulphur content of fuel complies with Regulation 14 of MARPOL 73/78 Annex IV and AMSA Marine Order 97.	EPO-ED-04	Fuel purchased in Australia shall meet Australian standards.	Records of low sulphur fuel usage.
Prevention			
None identified			
Reduction			
MODU and AHTS Vessels comply with Regulation 14 of MARPOL 73/78 Annex VI and AMSA Marine Order Part 97.	EPO-ED-04	Marine diesel engines meet NOx emission requirements and limits as set out by MARPOL 73/78, Annex VI, Regulation 13, and have an International Air	Vessel IAPP certificate. ODS Record Book. Records of SEEMP.

		Pollution Prevention (IAPP) certificate. Onboard incinerators (if present) will meet IMO standards and are identified in the vessels' IAPP certificate. Equipment and systems that contain ODS comply with MARPOL 73/78, Annex VI, Regulation 12, are identified in the vessels' IAPP certificate and an ODS record book is maintained (where applicable). Vessels >400 GT have a Ship Energy Efficiency Management Plan (SEEMP).	
Contractor PMS in place to maintain power generation systems and ancillary diesel engines.	EPO-ED-04	All MODU and vessel engines and power generation equipment shall be serviced in accordance with the relevant Contractor's PMS. Contractor's servicing and maintenance records shall be validated by VOGA to ensure they are up to date.	VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.
Contractor PMS in place to maintain refrigeration systems within the use of ODS.	EPO-ED-04	Refrigeration systems shall be maintained in accordance with contractor's PMS to ensure refrigerant emissions are minimised. Contractor's servicing and maintenance records shall be validated by	VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.

		VOGA to ensure they are up to date.	
Mitigation			
None identified	-	-	-
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
Low emissions vessels.	There is a limited availability of low emissions vessels (e.g. LNG, or battery powered), limited bunkering infrastructure (e.g. methanol), or the fuel technology readiness is not adequate (e.g. ammonia or hydrogen), such that it is not practicable to use these technologies.		Not adopted.
ALARP Summary: The impacts of atmospheric and GHG emissions are ALARP, based on the impact assessment outcomes using the VOGA Risk Matrix (as per Table 4-4), the ALARP template to determine the appropriate decision context type (Table 4-2) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.			

5.5.6 Acceptability Demonstration

Table 5-26: Acceptability demonstration – Atmospheric and GHG emissions

ACCEPTABLE LEVEL OF RISK DEMONSTRATED	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-25).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Impact managed in accordance with VOGA HSE policy and PMS.
Other requirements met	Yes – MARPOL 73/78, OPGGS(E)R, *Navigation Act 2012* (Cth), Marine Order 97, NGER Act.
RR < High (RRII)	Yes – Medium (RRIII).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-04. See Section 7 for further details.
Acceptability Summary The impacts from air and GHG emissions have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-25), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.6 Planned: Light Emissions

5.6.1 Hazard Report

Table 5-27: Hazard Report – Light emissions

HAZARD	Light emissions		
EP risk number	EP-ED-R06		
Activity/cause	MODU operations Vessel operations		
Extent	A conservative light emission buffer of 20 km from the Operational Area has been assessed.		
Potential impact description	Disruption to marine fauna, such as disorientation, attraction or repulsion of marine fauna and birds and potential altered foraging and breeding behaviours.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Plankton	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Fish, sharks and rays	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Marine reptiles	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Seabirds and shorebirds	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Relevant EPO(s)	EPO-ED-05 Impacts to marine fauna from light emissions will be limited to temporary behavioural change localised to the light source, with no species population-level impacts.		

5.6.2 Description of Hazard

The MODU and support vessels will be present within the Operational Area during exploration drilling activities. A maximum of two wells will be drilled within a single campaign which are estimated to take ~20 days each to complete. Artificial lighting is required for the safe operation of support vessels and the MODU. MODU and vessel deck lighting is kept on 24 hours a day for maritime safety purposes, in accordance with requirements of the *Navigation Act 2012* (Marine Order Part 30 (Prevention of Collisions)).

The distance that the light emissions will be visible from the source depends on the lighting type and the environmental conditions. Monitoring undertaken by Woodside (2014a) indicated that light density from navigational lighting attenuated to below 1.0 lux and 0.03 lux at distances of ~300 m and ~1.4 km, respectively from the source. These light densities are comparable to natural light densities experienced during deep twilight and during a quarter moon. Therefore, it is expected that the temporary change (~40 days) to ambient light levels will affect a radius of ~1.4 km from MODU and vessel operations.

As described in Section 2.10.1, the number of support vessels within the Operational Area may vary during the duration of exploration drilling activities. Concurrent light emissions have the potential to occur from multiple vessels in the Operational Area, particularity during MODU positioning. This scenario would include the MODU and 2 AHTS and will result in slightly elevated ambient light levels. Cumulative impacts from light during this scenario would be limited to a 3 day window per well. Therefore, light impacts during concurrent activities in the Operational Area are likely to be temporary in nature and are not expected to significantly increase impacts to marine fauna.

5.6.3 Impact and Risk Evaluation

Potential impacts caused by light emissions include:

- Disruption to marine fauna.

The following receptors within the Operational Area may be impacted by light emissions:

- Plankton
- Fish, sharks and rays
- Marine reptiles
- Seabirds and shorebirds.

5.6.3.1 Impact Assessment

Artificial lighting has the potential to disrupt marine fauna by altering the use of visual cues for orientation, navigation or other purposes. This results in behavioural responses which can alter migration, foraging and breeding activity. It can also create competitive advantages for some species and reduce reproductive success and/or survival in others.

As per the recommendations of the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c) a precautionary 20 km buffer from the light source has been used to assess species sensitive to light. This distance is considered conservative and is based on observed effects of sky glow on marine turtle hatchlings demonstrated to occur at 15-18 km and seabird fledglings grounding in response to artificial light 15 km away (DCCEEW, 2023c).

Plankton

The National Light Pollution Guidelines for Wildlife does not identify plankton as sensitive species to light pollution (DCCEEW, 2023c). However, studies have shown zooplankton to descend away from the surface light pollution caused by research vessels at depths of up to 200 m, and up to 200 m horizontally from the light source (Berge et al., 2020). Zooplankton naturally ascend to forage on phytoplankton that are found near the water's surface. Conversely, studies by Meekan et al. (2001) found that some zooplankton species were attracted to light sources. The increase of zooplankton in an area has been shown to result in a subsequent increase in predators (Shaw et al., 2002). Therefore, light emissions produced from the vessel activities has the potential to lead to a localised change in zooplankton density which may lead to indirect impacts to predators and the food chain. Due to the short-term duration of the activities, any impact is anticipated to be highly localised and temporary.

Fish, Sharks, and Rays

The National Light Pollution Guidelines for Wildlife does not identify fish, sharks or rays as sensitive species to light pollution (DCCEEW, 2023c). Previous studies have found that fish species can be attracted to light sources, similar to zooplankton (Meekan et al., 2001). The attraction of organisms to the light results in an increased food source for marine predators that aggregate around the edges of the visible light. This attraction is considered to be localised and other than some opportunistic predation, it is not considered to represent a significant impact to the local and regional food web. Therefore impacts have not been assessed further.

Marine Reptiles

The Recovery Plan for Marine Turtles in Australia (CoA, 2017) identifies light pollution as a threat to marine turtles. Artificial lighting along or adjacent to turtle nesting beaches has the potential to alter or disrupt nocturnal behaviours of nesting adult females and emerging hatchlings as they make the passage from the beach to the sea (DCCEEW, 2023c).

Female turtles nest on sandy tropical and sub-tropical beaches predominantly at night where they rely on visual cues to select nesting beaches and orient on land (DCCEEW, 2023c). Artificial light has been shown to impact these nesting behaviours of adult females (Witherington and Martin, 2003), such as influencing site selection, with females typically selecting beaches not exposed to artificial light (Price et al., 2018).

Studies have shown that hatchlings are particularly vulnerable to artificial light emissions. Most turtle hatchlings emerge at night and rely on a combination of topographic and brightness cues to rapidly orient themselves and find the ocean in order to avoid predation (Mrosovsky, 1968). Disorientation of hatchlings as they emerge has the potential to direct hatchlings away from the ocean (Limpus, 2009), leading to mortality from predation, exhaustion, dehydration, or interaction with human activities (Erb and Wyneken, 2019). Hatchlings have been observed to respond to artificial light emission up to 18 km away from the source whilst emerging on the beach (Kamrowski et al., 2014). Artificial lights can also disrupt hatchlings within nearshore waters by attracting hatchlings back to the shoreline (Truscott et al., 2017). Alternatively, hatchlings have also been reported to be found swimming around lights on vessels out at sea (Limpus et al., 2003). In the event that the light emissions attract fish, sharks, and rays, it may result in a higher level of predation.

As described in Section 3.4.3.6 several marine turtle species may be present within the Operational Area. The 20 km light emission buffer overlaps with BIAs and habitat critical to the survival of the following species:

- Flatback turtle
- Green turtle
- Hawksbill turtle
- Loggerhead turtle.

The ‘light EMBA’, which can be described as a 20 km buffer around the Operational Area, overlaps habitat critical to the survival of the flatback, green and hawksbill turtles. The flatback turtle has a 60 km buffer established seawards from known nesting sites such as those in the

Dampier Archipelago (35 km from the Operational Area). This buffer is identified as internesting habitat which is critical to the species during nesting activities which occur between October and March each year (CoA, 2017). Both the green and hawksbill turtles also have defined habitat critical to the survival associated with nesting sites in the Dampier Archipelago, however the buffer for these species only extends 20 km from nesting sites (CoA, 2017). The nesting season for the green turtle occurs between November and March, while hawksbill turtle nesting occurs between October and February each year (CoA, 2017). As activities associated with the exploration drilling program are proposed to be undertaken at any time of year (Section 2.3), there is potential that artificial light from MODU and vessel operations will be emitted during marine turtle nesting seasons.

Currently, there is no evidence, published or anecdotal, to suggest that artificial light from offshore vessels would impact internesting turtles or be a plausible threat based on their biology (Witherington and Martin, 2003). The Operational Area is located 35 km from the nearest shoreline, which exceeds the recommended 18 km buffer where hatchlings have been observed to respond to artificial light emission (DCCEEW, 2023c). Further, it is expected that the light buffer would not overlap the shallow coastal waters where biologically important activities occur, such as mating or reproduction, or directly overlap beaches where nesting occurs. Therefore, lighting from the MODU and support vessels is not predicted to impact turtle hatchling or breeding behaviours at nesting locations and therefore the impact of lighting on hatchling dispersal female turtle beach selection will be negligible.

There are no foraging BIAs for marine turtles overlapped by the Operational Area or light EMBA. The closest foraging BIA is located within the shallow waters surrounding the some of the islands of the Dampier Archipelago ~45 km from the Operational Area. Therefore, it is expected that any individuals within or adjacent to the Operational Area are transient and may forage opportunistically.

Turtles transiting in the surroundings of the Operational Area may be disturbed by the lights from MODU and vessel operations, however, given the large distances typically covered by marine turtles, impacts will be limited. Therefore, artificial light from the exploration activities may impact individual marine turtles, but it is not anticipated to result in impacts at a population-level or disrupt ecosystem functioning. Any impacts are expected to be highly localised and short-term.

Seabirds and Shorebirds

The Wildlife Conservation Plan for Seabirds identifies light pollution as a threat to seabirds (CoA, 2020). Previous studies have shown artificial light to cause disruption to seabird and shorebird behaviours, such as disorientation resulting in collision, entrapment, stranding, grounding, and interference with navigation (DCCEEW, 2023c). There are a range of conflicting reports on the attractiveness of different light wavelengths to seabirds. In general, very bright light, regardless of colour, has been shown to attract seabirds (Raine et al., 2007), indicating that the light intensity may be a more important cue than colour for seabirds (DCCEEW, 2023c). Bright white lights on vessels have been shown attract seabirds at night, particularly on nights with little moonlight or low visibility (Merkel and Johansen, 2011).

The impact that artificial light has depends on the species and has been known to be exacerbated by the phase of the moon (Deppe et al., 2017), wind direction and strength (Syposz

et al., 2018), precipitation, cloud cover, and the proximity of nesting sites or migrating sites to artificial light sources (Rodríguez et al., 2015). Seabird species which are active at night, such as procellariforms (i.e. petrels, shearwaters, and albatross species) have been shown to be more vulnerable to impacts from artificial light (DCCEEW, 2023c).

The fledgling phase for procellariforms is considered a critical phase in the life cycle of the species (Rodriquez et al., 2017). The fledging season may vary between species; however it is known to occur over a short period of time with the first flight typically occurring within the first two hours after sunset (Chevillion et al., 2022). Artificial light has been shown to disrupt fledglings sea-finding cues during their emergence from the nesting sites. Studies have shown this disorientation has the potential to lead to seabird fledgling grounding in response to a light source at least 15 km away (Rodriguez et al., 2014).

Adult seabirds are less vulnerable to artificial light than fledglings. Adult procellariforms are the most vulnerable when returning to and leaving the nesting colony (CoA, 2020). A recent study demonstrated that artificial light disrupts adult nest attendance, subsequently affecting the weight gain and potential survival of the chicks (Cianchetti-Benedetti et al., 2018).

As described in Section 3.4.3.3 several seabird and shorebirds species may be present within the Operational Area. There are no habitats critical to the survival of threatened albatross and petrel species within the light EMBA, this includes known foraging and nesting sites. The 20 km light emission buffer does overlap with two BIAs:

- Roseate tern – reproduction BIA
- Wedge-tailed shearwater – reproduction BIAs.

The roseate tern is diurnal, meaning they are active at day and rest at night (DCCEEW, 2025). Therefore, any impacts from artificial light emissions from the activity are anticipated to be negligible and have not been assessed further.

The wedge-tailed shearwater is EPBC Act listed marine and migratory species that does not have a recovery plan or conservation advice but is covered by the Wildlife Conservation Plan for Seabirds (CoA, 2020). As a procellariform the wedge-tailed shearwater may be active at night. Diving seabirds, particularly petrels, are sensitive to artificial light emissions, and can be disoriented during flying and foraging (Marangoni et al., 2022). It is anticipated that artificial light at night may increase prey concentration in the localised area increasing the opportunity for seabird foraging activities. Gull species have been recorded to increase foraging efforts where there are increased concentrations of prey in artificially lit areas in marine and coastal environments (Marangoni et al., 2022). Although no foraging BIA for the species as identified within the light EMBA, the wedge-tailed shearwater would be expected to forage within the Operational Area and light EMBA during the breeding season (August to April) when it can be found along the coast between Exmouth and Port Headland. Therefore, the presence of artificial light from MODU and vessel operations may increase foraging opportunities.

As discussed above, a critical phase of life for shearwaters is at fledgling when dependence on parents and life on land shifts to independence at sea. Fledglings are vulnerable to becoming disorientated during their first flight when exposed to artificial light, with some fledglings leaving the nest but becoming attracted towards artificial lighting. This disorientation can lead to injury or fatality from fallouts over the ocean, groundings or collisions with infrastructure (Rodríguez et

al., 2017; Marangoni et al., 2022). Studies have shown that some fledglings will not make their first flight due to light emissions if the nesting habitat does not become dark (DCCEEW, 2023c).

The wedge-tailed shearwater reproduction BIA is based on buffer areas surrounding the offshore islands (e.g. within Dampier Archipelago) that are used for nesting by this species (Section 3.4.3.3). Given the Dampier Archipelago coastline is approximately 35 km from the Operational Area, lighting from the MODU and support vessels is unlikely to impact fledgling wedge-tailed shearwaters, as grounding is predicted in response to a light source 15 km away (Rodriguez et al., 2014). Therefore, artificial light emissions from the activity only have the potential to temporarily attract individuals to nocturnally forage within the area which will not result in negative impacts to seabird populations, biologically important activities, or ecosystem function.

5.6.4 Risk Ranking

Potential impacts or risks to threatened species are not anticipated, as important habitats for the threatened EPBC listed species are located more than 20 km away from the Operational Area, as per the recommendations of the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c). Therefore:

- The consequence ranking of '1' (Incidental) was assigned to marina fauna (plankton, marine reptiles, seabirds and shorebirds) and likelihood of 'E' (almost certain) was considered appropriate, given MODU and vessel deck lighting has to be kept on 24 hours a day for maritime navigational and safety purposes, resulting in a risk ranking of 'Medium' (RRIII).

5.6.5 ALARP Demonstration

Table 5-28: Demonstration of ALARP – Light emissions

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
-	-	-	-
Substitution			
-	-	-	-
Prevention			
-	-	-	-
Reduction			
Lighting will be limited to the minimum required for navigational and safety requirements, with the exception of emergency events.	EPO-ED-05	Reduce unnecessary MODU and vessel lighting to only those required for safe work and navigational use, in accordance with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c).	Inspection and memo verifies no unnecessary light other than usage for safe work and navigation.

Mitigation			
-	-	-	-
Other			
-	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
Exclude night-time operations.	The potential impact to marine turtles and birds is considered incidental, so excluding night-time operations will not reduce impact significantly. Cost considered disproportionate given no significant environmental benefit.		Not adopted.
Conduct the drilling activities outside seabird breeding or migration seasons to avoid light impacts to fauna.	The potential impact to birds is considered incidental, so avoiding periods of important behaviours will not reduce impact significantly. Cost considered disproportionate given no significant environmental benefit.		Not adopted.
Implement an Offshore Seabird Management Plan.	Impacts to threatened species are not anticipated due to the distance the activity is from important habitats. Nesting colonies for the wedge-tailed shearwater are around 35 km from known breeding islands in the Dampier Archipelago. Considering impacts to wedge-tailed shearwater fledglings from grounding is predicted in response to a light source 15 km away (Rodriguez et al., 2014), it is considered that operational lighting from the activity will not impact fledglings. As population level impacts are not predicted to seabird species the control is considered disproportionate to the limited potential benefit.		Not adopted.
Reducing lighting levels.	Current lighting levels are as required to provide a safe working environment for vessel personnel, as well as to provide for navigational safety in the area. A reduction could be undertaken via limiting or excluding night-time operations. However, this is not considered feasible, and given the minimal impact to EPBC Act-listed marine species (e.g. turtles) occurring due to lighting, the financial, and environmental costs incurred by requiring all works to be undertaken during daylight hours only (therefore disrupting operational activities) is unfeasible and grossly disproportionate to any environmental benefit.		Not adopted.
Consider Marine Turtle Light Mitigation Toolbox from the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c)	Implement light management options to reduce the impact of artificial lighting to marine turtles. Review of the options considered that the actions would not reduce the impact significantly, except for the control measure for limiting light to the minimum required for navigational and safety requirements, which has been adopted.		Not adopted.

Consider Best Practice Lighting Design from the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c)	Substitute external lighting with light sources that minimise the effects of artificial light on marine turtles (e.g. reduced or filtered-out blue, violet and ultraviolet wavelengths). The potential impact to marine turtles and birds is considered incidental, so replacing external lighting with light sources appropriate for wildlife will not reduce impact significantly. Cost considered disproportionate given no significant environmental benefit.	Not adopted
ALARP Summary: The impacts of light emissions activities are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-4), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.		

5.6.6 Acceptability Demonstration

Table 5-29: Acceptability demonstration – Light emissions

ACCEPTABLE LEVEL OF RISK DEMONSTRATED	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-28).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes, including: • MARPOL 73/78 Annex VI • AMSA Marine Order 97 • *Navigation Act 2012* • National Light Pollution guidelines for Wildlife (DCCEEW, 2023c) • National Recovery Plan for albatrosses and petrels (2022) (DCCEEW, 2022) • Wildlife Conservation Plan for Seabirds (CoA, 2022) • Recovery Plan for Marine Turtles in Australia, 2017-2027 (Commonwealth of Australia, 2017) • Approved Conservation Advice for *Dermochelys coriacea* (Leatherback Turtle) (DEWHA, 2008c).
RR < High (RRII)	Yes – Medium (RRIII)
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-05 See Section 7 for further details.
Acceptability Summary The impacts of light emissions have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-28), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.7 Planned: Vessel Discharges

5.7.1 Hazard Report

Table 5-30: Hazard Report – Vessel discharges

HAZARD	Vessel Discharges		
EP risk number	EP-ED-R07		
Activity/cause	MODU operations Vessel operations		
Extent	Within 100 m of the discharge		
Potential impact description	A change in water quality, including localised eutrophication of the water column, and localised adverse effects to marine biota, such as marine fauna behaviour and potential injury / mortality to marine fauna.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Water quality	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Marine fauna	Incidental (1)	Possible (C)	Low (RRIV)
Plankton	Incidental (1)	Unlikely (B)	Low (RRIV)
Relevant EPO(s)	EPO-ED-06 No serious or irreversible change in water quality which may adversely impact on biodiversity, ecological integrity, social amenity or human health.		

5.7.2 Description of Hazard

The MODU and support vessels required to undertake the exploration drilling activities will release routine discharges into the marine environment. These vessel discharges will only occur within the Operational Area with volumes dependent on the duration of the activity and the number of POB.

The maximum duration that the MODU and support vessels are expected to be present within the Operational Area is 15-20 days per well, with up to two wells per campaign. Expected POB is up to 150 persons for the MODU and up to 45 persons total for the support vessels. Noting a maximum of three support vessels (two AHTS and an additional support vessel) may be used for the duration of the exploration campaign with a typical crew of 15 persons on each vessel (Section 2.10.1).

A description of each discharge stream is provided in Table 5-31.

Table 5-31: Description of routine vessel discharges

Routine discharge	Description	Estimated volume
Sewage, greywater and putrescible waste	Sewage Sewage will go through an extended aeration system prior to release. Once treated, sewage will be discharged into the marine environment. Putrescible waste Food scraps will be macerated then discharged into the marine environment. Scraps that cannot be macerated, or are not readily degradable, such as bones, onion peels and orange rinds, are bagged and disposed of onshore with the general rubbish. Grey water Grey water is comprised of potable water, soaps and detergents and is discharged from the vessel to the marine environment.	A maximum of 39m^3 per day of domestic discharges (based on 200 L/day/person)
Brine	Desalination brine is a discharge resulting from reverse osmosis desalination equipment that produces potable water from seawater for use on the vessels. The salinity of the discharged desalination brine is slightly higher (approximately 10%) than seawater and may contain small quantities of scale inhibitor.	The volume of the discharge is dependent on the requirement for fresh (or potable) water and would vary between vessels and the POB.
Bilge and deck drainage	Small quantities of grease and oil accumulate in operational areas on vessel deck surfaces creating potential slip hazards which are required to be washed down with water and detergent. The wash-down process flushes the accumulations into the vessel-contained drain systems. The discharge of contaminated bilge water from vessels is inclusive of deck drainage and may contain water, oil, dispersants, detergents, solvents, chemicals, particles and other liquids, solids or chemicals. While in the Operational Area, the vessels may discharge oily water after treatment to 15 parts per million (ppm) via an oily water filter system approved under Australian Marine Order 91.	< 1 m^3 at up to 2 Prospect Areas per campaign
Cooling water	Cooling water is seawater that is utilised as a heat exchange medium for the power generation system on vessels. To prevent marine growth in the seawater circulation system, seawater is treated by a Marine Growth Prevention System, which involves producing chlorine electrically and continuous dosing at 2 mg/L. Cooling water is discharged to the marine environment from the cooling system at an elevated temperature of 0.5 to 3°C.	Cooling water is discharged to the marine environment at a rate of 80-100 m^3/hour.

5.7.3 Impact and Risk Evaluation

Potential impacts from routine vessel discharges include:

- Change in water quality
- Change in marine fauna behaviour
- Injury/mortality to plankton.

The following receptors within the Operational Area may be impacted by routine discharges:

- Water quality
- Marine fauna
- Plankton.

5.7.3.1 Impact Assessment

Water Quality

Change in Water Quality

Daily MODU and support vessel operations will result in localised changes to the water quality within the vicinity of discharge point. Routine vessel discharges may result in increased temperature, chemicals, nutrients or salinity within the water column. All discharges will occur within the Operational Area.

Temperature

Following a discharge into the marine environment cooling water is subject to turbulent mixing resulting in a transfer of heat to the receiving environment, thereby increasing the ambient temperature of the surrounding water.

Modelling produced for Woodside found that the temperature of discharged water was <1°C above ambient within 100 m (horizontally) of the discharge point, and 10 m vertically (Woodside, 2014b). The localised nature of the discharge and the dynamic open ocean conditions within the Operational Area ensures the change in water temperature will be short-term and ambient conditions will be readily re-established with increasing distance from the discharge point. Therefore, the impact of a change in water temperature on water quality is expected to be incidental.

Chemicals

Bilge water contains various chemical contaminants such as oil, lubricants and cleaning chemicals, as well as scale inhibitors and biocides used in bilge and deck drainage treatment. While these chemicals will likely result in a localised reduction in water quality upon discharge, there may also be potential toxicity impacts to marine fauna (discussed below).

Modelling by Shell (2009) indicates that upon discharge, hydrocarbon and other chemical concentrations are rapidly diluted within less than 100 m of the discharge point, over a relatively short period of time. Hinwood et al. (1994) further predicted dilution factors in excess of 10,000

within 100 m of the discharge point, and Black et al. (1994) states that potential environmental impacts from deck drainage are considered to be slight given the rates of dilution that are likely offshore.

On discharge to the marine environment, chemical contaminants, including oil, will be localised to the discharge point and subject to rapid dilution due to the open ocean environment in the Operational Area (i.e. water depth, strong ocean currents and metocean conditions). Given the activity is also short-term (15-20 days per well), the impact of chemicals on water quality is expected to be incidental.

Nutrients

The primary concerns related to the discharge of sewage, greywater and putrescible waste (wastewater discharges) are nutrient enrichment of the receiving environment and increased biological oxygen demand.

In a study of sewage discharge in deep ocean waters, Friligos (1985) reported no appreciable differences in the inorganic nutrient levels between the outfall area and background concentrations, suggesting rapid uptake of nutrients and/or rapid dispersion in the surrounding waters. Further, in an open ocean environment, like that of the Operational Area, the effect of the effluent biological oxygen demand on seawater oxygen concentrations is expected to be insignificant (Black et al., 1994).

On discharge to the marine environment, wastewater will be localised to the discharge point and subject to rapid dilution due to the open ocean environment in the Operational Area (i.e. water depth, strong ocean currents and metocean conditions). Given the activity is also short-term (15-20 days per well), the impact of wastewater on water quality is expected to be incidental.

Salinity

Desalination brine is of greater density than seawater and will sink and disperse in the currents upon discharge. Therefore, the greatest increase of salinity in the receiving environment will be experienced within the immediate vicinity of the discharge point.

Near-field dilution is anticipated to occur rapidly, resulting in a return to ambient salinity levels within 10 m of the discharge (Raventos et al., 2006). This assumption is supported by additional studies which also found that elevated salinity declines rapidly close to the discharge, even where simple diffusers are utilised (Fernandez-Torquemada et al., 2005).

Therefore, any increase in salinity within the marine environment will be localised, and of a short duration, with high dispersion and dilution rates due to the open ocean environment in the Operational Area (i.e. water depth, strong ocean currents and metocean conditions) resulting in an incidental impact to water quality.

Plankton

Injury/Mortality

Plankton are typically considered more vulnerable to the impacts of routine vessel discharges compared to mobile species due to their inability to move away from the discharge plume.

Planktonic species may experience toxicity effects from the chemical discharges associated with deck drainage and bilge water. They may also drift with the cooling water discharge as it disperses and decreases in temperature and may be sensitive to the thermal changes. However, as discussed above, routine vessel discharges are anticipated to rapidly disperse and dilute into the surrounding water, and any impact is expected to occur within the immediate vicinity of the release.

Plankton are known to accumulate rapidly and are generally not found to be sensitive to the impacts of contaminants within the water column (Hook et al., 2016). Changes to water quality that may impact plankton will be localised to the discharge point with discharges subject to rapid dilution due to the open ocean environment in the Operational Area (i.e. water depth, strong ocean currents and metocean conditions). Therefore, vessel discharges are not predicted to have ecologically significant effects on planktonic species.

Marine Fauna

Change in Behaviour

As discussed above, vessel discharges are localised with rapid dilution expected within the open ocean environment. Marine fauna within the Operational Area are likely to be transient. If contact does occur with any marine fauna, it will be for a short duration due to the small volumes released to the marine environment and the rapid dispersion of the plume such that any exposure to marine fauna is likely not of sufficient duration to cause a toxic effect.

The discharge of sewage and food waste may attract fishes and seabirds, which in turn may attract predatory species. However, this behavioural impact will be localised and temporary as the discharges will be quickly consumed by scavenging fauna, broken down by microbial activity, and/or dispersed by waves and ocean currents. Therefore, any behavioural impacts are expected to be short-term and incidental.

5.7.4 Risk Ranking

Routine vessel discharges are expected to result in highly localised and short-term changes to water quality. Due to the offshore oceanographic nature of the environment, the minimal volume, and low toxicity of the discharges, impacts to plankton present within the immediate vicinity of the discharge release are expected to be localised and short-term and not affect population functioning. Therefore:

- The consequence ranking of ‘1’ (Incidental) was assigned to water quality, and a likelihood of ‘E’ (Almost Certain) was considered appropriate, resulting in a risk ranking of ‘Medium’ (RRIII).
- The consequence ranking of ‘1’ (Incidental) was assigned to marine fauna, and a likelihood of ‘C’ (Possible) was considered appropriate, resulting in a risk ranking of ‘Low’ (RRIV).

- The consequence ranking of '1' (Incidental) was assigned to plankton, and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).

5.7.5 ALARP Demonstration

Table 5-32: Demonstration of ALARP – Vessel discharges

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
Chemical assessment and selection process.	EPO-ED-06	Chemicals that will be discharged to the marine environment are selected in accordance with VOGA's Chemical Assessment Process (Section 8.3.7).	Completed chemical assessments show chemicals discharged to the marine environment meet the criteria of VOGA's Chemical Assessment Process (Section 8.3.7).
Prevention			
Engines on board the MODU and support vessels are to be maintained in accordance with the manufacturer's specifications.	EPO-ED-06	All MODU and vessel engines and power generation equipment shall be serviced in accordance with the relevant contractor's PMS. Contractor's servicing and maintenance records shall be validated by VOGA to ensure they are up to date.	VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.
Reduction			
MODU and support vessels are required to comply with MARPOL 73/78 Annex I, Annex IV, Annex V, and AMSA Marine Orders 91 and 96.	EPO-ED-06	Vessel contractor procedures include the requirements to comply with MARPOL 73/78 (Annex IV; Regulation 8) as required by class: • equipped with either a sewage treatment plant or sewage comminuting and disinfecting system	Vessel international Sewage Pollution Prevention Certificate.

		or a sewage holding tank • wastes shall be macerated to <25 mm prior to discharge • untreated sewage will be stored on-board in suitable holding tanks and disposed of onshore at reception facility or to carrier licenced to receive the waste or discharged at a distance of more than 12 nm from the nearest land. Vessel contractor procedures include the requirements to comply with MARPOL 73/78 (Annex I; Regulation 15) as required by class: • deck drainage and bilge water will be treated in an oil water separator and discharged.	
Mitigation			
None identified	-	-	-
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
Onshore disposal of food scraps, sewage and grey waste.	All food scraps, sewage and grey waste transported to shore for land-based disposal. This would result in an increase in transportation requirements (and increased atmospheric emissions, safety risk and cost). Onshore disposal would have environmental impacts that may be greater than those created by offshore disposal, e.g. added energy needed (and associated emissions) for sewage and greywater treatment. It also provides an increased exposure to biological health hazards and considered grossly disproportionate to any environmental benefit gained.		Not adopted.

Onshore treatment and disposal of deck drainage and bilge.	Collecting and transporting the water onshore for treatment and disposal was considered but rejected due to the additional potential risks associated with transportation to shore (e.g. lifting and transport and fuel-related emissions). This trade-off was considered undesirable given the limited potential impact of deck drainage to the marine environment and considered grossly disproportionate to any environmental benefit gained.	Not adopted.
Enhanced treatment of deck drainage and bilge offshore prior to discharge.	Considered grossly disproportionate due to the high cost of retrofitting additional treatment packages to the existing drains water treatment systems; and the minor environmental impact of the discharge.	Not adopted.
Alternative supply of potable water.	Means of transportation which would introduce/increase other environmental impact, increased safety risk and cost. This trade-off was considered undesirable and grossly disproportionate given the limited potential impact of desalination brine to the marine environment.	Not adopted.
ALARP Summary: The impacts of routine discharges are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-4), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.		

5.7.6 Acceptability Demonstration

Table 5-33: Acceptability demonstration – Vessel discharges

ACCEPTABLE LEVEL OF RISK DEMONSTRATED	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-33).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Marine Orders 91 and 96.
RR < High (RRII)	Yes – Medium (RRIII)
EPO(s) manage impacts to acceptable level(s)	Yes – the following relevant EPOs will be maintained: EPO-ED-06 See Section 7 for further details.
Acceptability Summary The impacts of routine discharges have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-33), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.8 Planned: Drilling Material Discharges – Drill Cuttings, Drilled Cement, Steel Shavings and Drilling Fluids

5.8.1 Hazard Report

Table 5-34: Hazard Report – Drilling material discharges – Drill cuttings, drilled cement, steel shavings and drilling fluids

HAZARD	Drilling material discharges – drill cuttings, drilled cement, steel shavings and drilling fluids		
EP risk number	EP-ED-R08		
Activity/cause	Drilling activities		
Extent	Discharges will be released at the seabed, and impact will be localised with 100 mg/L of total suspended solids within 100 m from the source of discharge.		
Potential impact description	A change in water quality, and localised adverse effect to benthic assemblages and plankton.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Water quality	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Benthic assemblages	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Plankton	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Relevant EPO(s)	EPO-ED-06 No serious or irreversible change in water quality which may adversely impact on biodiversity, ecological integrity, social amenity or human health.		

5.8.2 Description of Hazard

The project will involve the drilling of up to 7 exploration wells which will be drilled within a period of ~15-20 days per well. The initial campaign will comprise of one well. Subsequent campaigns may include up to 2 wells per campaign. Drilling activities will result in the indirect discharge of a small quantity of discharges at the seabed consisting of:

- Drill cuttings
- Drilled cement
- Steel shavings
- Drilling fluids at the seafloor.

Drilling activities are described in Section 2.6. The well will be drilled in a series of sections with the surface hole drilled using seawater and PHG to clean the hole with PHG used to provide stability for running the surface casing. Drilling fluids and cuttings will exit the wellbore at the seabed during drilling and while the conductor is installed. These discharges will result in a localised area of sediment deposition known as a cuttings pile around and in proximity to the well which will be influenced by seabed currents.

Once the surface casing is installed, a closed circulating system will be established between the wellbore and MODU, which allows discharges to be circulated back to the MODU. The cuttings are separated from drilling fluids onboard the MODU using a solids control system and discharged at the sea surface or re-used in the closed loop system. The remainder of the well will be drilled with WBM which will be discharged from the MODU at the sea surface along with cuttings and residual fluids.

If fluids are recirculated back into the fluid system, there are a number of mud pits (tanks) on the MODU which provide the capacity to mix, maintain and store fluids required for drilling activities. Fluids may be discharged at the end of specific well sections or when the drilling cannot be re-used, or if there is a requirement to change the drilling fluid system. Bulk discharge of this type of fluids is only permitted for WBM.

Drilling fluid will consist primarily of seawater and may have small quantities of WBM additives which will be discharged at the sea surface. These WBM additives are considered to be very low toxicity (all fluids will be selected as per VOGA's chemical selection process) as described in Section 2.9 and are expected to dilute rapidly upon discharge; as such no toxic effect to biota are expected to occur. Volumes of excess drilling fluid will be limited as fluids are mixed for use on an as needs basis. Where applicable, drilling fluids will be carried over between hole sections. Any remaining drilling fluid (mud and brine) will be discharged overboard at the end of the drilling program. This volume will be minimised through careful mud management.

During cementing operations, surface cementing equipment and lines will need to be flushed, washed and cleaned with water to prevent hard setting which will result in cement cuttings being discharged. Cementing operations will be undertaken for zonal isolation, well integrity, structural support of casing, temporary suspension plug or P&A to abandon the well (described in 2.6.3), and contingency activities (described in Section 2.6.5.4). There may be some excess cement discharged directly at the seabed during cementing of surface casting. Impacts of cement and cementing fluids are outlined further in Section 5.9.

The discharge locations and approximate drill cuttings, drilling fluid, and drilling cement volumes are listed in Table 2-8.

Contingent Activities

A well re-spud may be required if technical issues are encountered during drilling which will involve moving the cantilever to a new position to commence re-spud drilling. A sidetrack is an alternative to a well re-spud which involves drilling a secondary wellbore away from the primary bore. A well re-spud or sidetrack would result in an increase in the volume of cuttings and cement generated as per Table 2-8.

5.8.3 Impact and Risk Evaluation

Potential impacts from drilling material discharges include:

- Change in water quality
- Injury/mortality to benthic habitats and assemblages
- Injury/mortality to plankton.

The following receptors within the Operational Area may be impacted by drilling material discharges:

- Water quality
- Benthic habitats and assemblages
- Plankton.

5.8.3.1 Impact Assessment

Some fluids are discharged at the sea surface and some are discharged at the seabed. Due to the water depth in the Operational Area (50-60 m), water quality and plankton may be impacted from drilling material discharges.

Water Quality

Change in Water Quality

Drill cuttings and drilling fluid discharges are expected to increase turbidity and change water quality in the vicinity of the wellbore or at the sea surface from the MODU. Drill cuttings discharge will be generally intermittent and of short duration (over a period of 10-15 days) during the drilling of each well.

Drilling fluids (WBM) will be discharged at the seabed which will cause localised elevated turbidity in the water column above the seabed surrounding the wellbore. The change in water quality will be temporary, limited to operational discharges during drilling and subject to rapid dispersion and dilution by prevailing seabed currents.

When drill cuttings and retained drilling fluids (WBM) are discharged from the MODU at the sea surface, the larger particles form a plume which will rapidly drop out of suspension in the water and settle on the seabed. Some of the finer solids will form a plume at the surface that will be transported by prevailing currents away from the MODU and rapidly diluted in receiving waters (Neff, 2005; 2010). The discharge of cuttings with adhered fluids dilutes rapidly, with studies finding that drilling cuttings and fluid plumes released at the surface will have diluted to a factor of at least 10,000 within 100 m of the MODU. Neff (2005) states that plumes are diluted by more than 100-fold within 10 m of the discharge site.

Using the widely-accepted dilution factor of 10,000 (Neff, 2005), cuttings (and adhered fluids) are expected to reach 100 mg/L of total suspended solids within 100 m of the MODU. Using a conservative ocean current speed of 0.1 m/s, these discharges are expected to disperse to 100 mg/L within ~16 minutes.

Dispersion of the cuttings plume is influenced by particle size distribution of the cuttings and fluids, discharge rates and events, and metocean conditions such as ocean current speed. Due to rapid dispersion and the short period of intermittent discharge, the plume is expected to be highly localised and not predicted to impact productivity of the water column (Neff et al., 2000).

Plankton

Injury/mortality

Injury or mortality to planktonic species may occur due a change in water quality following discharges of drill cuttings and fluids. Impacts to these organisms can be due to both physical and chemical changes of water quality.

As discussed above, the widely accepted dilution factor of 10,000 (Neff, 2005), cuttings and residual fluids are expected to reach 100 mg/L total suspended solids within 100 m of the MODU over a period of ~16 minutes. Minimal impact to plankton is expected from the discharge of drilling cuttings. Neff (2010) outlines that the lack of toxicity and low bioaccumulation potential of drilling muds means the effects of discharged are highly localised and not expected to impact the species at a population level or impact the planktonic food web.

Impacts to zooplankton may be associated with variations in predatory and prey dynamics with species that are visual feeders impacted by water turbidity (Gophen, 2015), and phytoplankton being impacted by a decrease in availability of light, therefore reducing productivity (Dokulil, 1994).

Jenkins and McKinnon (2006) found that levels of suspended sediments greater than 500 mg/L are likely to have some impact on larvae of most fish species and levels of 100 mg/L will affect the larvae of some fish and invertebrate species if exposed for periods greater than 96 hours. However, dilution estimates (Hinwood et al., 1994; Neff, 2005) suggest that suspended sediment concentrations caused by discharged drill cuttings will be well below the levels required to impact fish or invertebrate larvae beyond the vicinity of the discharge site.

Due to low levels of planktonic productivity in the Operational Area, plankton populations are not expected to be impacted by drilling discharges. Additionally, due to the open nature of the marine environment, metocean conditions in the EMBA, and dispersive nature of the drilling muds within a marine environment, it is expected that impacts to plankton species will be limited to within tens of metres from the discharge point and return to previous conditions within a relatively short period of time. On this basis, the impacts to plankton from routine and non-routine discharges during drilling activities will be slight and short-term.

Benthic Habitats and Assemblages

Change to Benthic Habitats and Assemblages

The discharge of drill cuttings and unrecoverable fluids at the seabed during drilling will result in a localised area of sediment deposition (known as a cuttings pile) surrounding the well site. The cuttings pile distribution may reflect prevailing seabed currents and spread predominately downstream of the well site but overall extent from the well site is typically tens of metres. The dimensions of the cuttings pile depend on several factors, including volume (approximately 100 m^3 of production hole and 55 m^3 of surface hole cuttings per well; Table 2-8.) and composition of cuttings, and oceanographic conditions at the discharge location. The surface hole well section drill cuttings and retained drilling fluids (WBM) to seabed have the greatest impact to modification of the habitat in proximity to the well, as the solids tend to clump and settle rapidly around the discharge point (Neff, 2010).

Key additives used in WBM (outlined in Section 2.6.2.2) are xanthum gum (viscosifier), bentonite (viscosifier) and barite (weighting agent). These additives have a low toxicity and pose little to no risk to the environment (Section 2.6.2.3).

As described above, drill cuttings and retained drilling fluids will be discharged below the water column at the MODU site, which will rapidly disperse through the water column. Larger cutting particles will drop out of suspension and deposit on the seabed in proximity to the well site (tens to hundreds of metres distance) with the potential for localised spreading down current. Finer particle will remain suspended and be transported further from the well site, rapidly diluting and depositing over a larger area (hundreds of metres to kilometres) down current from the well. The final deposition of the drill cuttings and drilling fluids is largely determined by the seabed depth and the time for particles to drop out of suspension from the water column.

Benthic organisms below the cuttings pile will be smothered and buried. However, the cuttings pile is expected to be recolonised over time. Ecological impacts to benthic biota are predicted when sediment deposition is equal to or greater than 6.5 mm in thickness (IOGP, 2016). The amount of sediment deposition from surface hole and production hole cuttings is expected to be confined to within a few hundred metres around the well location, although this depends on the nature of the cuttings, the water depth and currents of the receiving environment (IOGP, 2016). A conservative radius of 500 m representing a zone of potential ecological impact has been applied to each well location for this impact assessment. Mobile benthic fauna, such as demersal fish, may be temporarily displaced from where cuttings discharges accumulate.

Furthermore, ecological impacts are not expected for mobile benthic fauna such as crabs and shrimps or pelagic and demersal fish, given their mobility (IOGP, 2016). Balcom et al. (2012) concluded that impacts associated with discharging cuttings and base fluids are minimal, with impacts highly localised to the area of the discharge deposition on the seabed. Changes to benthic communities are normally slight with short-term impacts.

Organic enrichment can occur, leading to anoxic conditions in the surface sediments and a loss of infauna species that have a low tolerance to low oxygen concentrations, and to a lesser extent chemical toxicity near the well location. These impacts are highly localised with short-term recovery that may include changes in community composition with the replacement of infauna species that are hypoxia-tolerant (IOGP, 2016). Recovery of affected benthic infauna, epifauna and demersal communities is expected to occur, given the short duration of sediment deposition and the widely represented benthic and demersal community composition.

It is acknowledged that fines (associated with the drilling fluids) will disperse beyond the zone of potential ecological impact but there are no associated ecological effects expected beyond this zone (500 m distance from each well site). Low levels of sediment deposition away from the immediate area of each well site would represent a thin layer of settled drill cuttings and drilling fluids, which will likely be naturally reworked into surface sediment layers through bioturbation (US Environmental Protection Agency, 2000). Metals such as barite from the drilling fluid additives are used as a tracer of dispersion and are typically detected beyond the zone of ecological impact but as discussed for sediment quality (above), the insoluble mineralised salts (the source of barite) have low bioavailability to benthic biota.

Impacts associated with routine and non-routine drilling discharges will be largely limited to an area surrounding each well. The low sensitivity of the benthic habitats and assemblages within

and in the vicinity of the Operational Area, combined with the low toxicity of WBMs and the highly localised nature and scale of predicted physical impacts to seabed biota, affirm that predicted impact from these discharges is considered likely but of a slight environmental consequence.

5.8.4 Risk Ranking

Drilling material discharges are expected to result in highly localised and short-term changes to water quality. Due to the offshore oceanographic nature of the environment, the minimal volume, and low toxicity of the discharges, impacts to benthic assemblages and plankton present within the immediate vicinity of the discharge release are expected to be localised and short-term and not affect population functioning. Therefore:

- The consequence ranking of '1' (Incidental) was assigned to water quality, and a likelihood of 'E' (Almost Certain) was considered appropriate, resulting in a risk ranking of 'Medium' (RRIII).
- The consequence ranking of '1' (Incidental) was assigned to benthic assemblages and plankton, and a likelihood of 'E' (Almost Certain) was considered appropriate, resulting in a risk ranking of 'Medium' (RRIII).

5.8.5 ALARP Demonstration

Table 5-35: Demonstration of ALARP – Drilling material discharges – Drill cuttings, drilled cement, steel shavings and drilling fluids

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
Chemical assessment and selection process.	EPO-ED-06	Chemicals that will be discharged to the marine environment are selected in accordance with VOGA's Chemical Assessment Process (Section 8.3.7).	Completed chemical assessments show chemicals discharged to the marine environment meet the criteria of VOGA's Chemical Assessment Process (Section 8.3.7).
Prevention			
Only WBM used for drilling, rather than synthetic-based muds.	EPO-ED-06	The contractor ensures only WBM are used during the drilling activities.	Records confirm only WBM has been used.

Reduction			
Solids Control System used to remove cuttings from drilling fluids in order to keep fluids in specification for reuse.	EPO-ED-06	Volumes of drill fluids discharged will be minimised through the use of solids control equipment.	Records confirm solids control equipment is used and discharge volumes are tracked.
Mitigation			
None identified	-	-	-
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
None identified	-		-
ALARP Summary: The impacts from drilling material discharges are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-4), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.			

5.8.6 Acceptability Demonstration

Table 5-36: Acceptability demonstration – Drilling material discharges – Drill cuttings, drilled cement, steel shavings and drilling fluids

ACCEPTABLE LEVEL OF RISK DEMONSTRATED	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-35).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	N/A
RR < High (RRII)	Yes – Medium (RRIII)
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-06 See Section 7 for further details.
Acceptability Summary The impacts from drilling material discharges have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-7), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.9 Planned: Non-drilling Material Discharges – Cement, Cementing Fluids, and Unused Bulk Products

5.9.1 Hazard Report

Table 5-37: Hazard Report – Non-drilling material discharges – Cement, cementing fluids, and unused bulk products

HAZARD	Non-drilling material discharges – cement, cementing fluids, and unused bulk products		
EP risk number	EP-ED-R09		
Activity/cause	Cementing operations, contingency activities, well abandonment, bulk material disposal		
Extent	Materials will be released at the seabed or the sea surface, and impact will be localised at the source of discharge.		
Potential impact description	Change in water quality. Localised adverse effect to benthic communities.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Water quality	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Benthic habitats and assemblages	Incidental (1)	Almost Certain (E)	Medium (RRIII)
Relevant EPO(s)	EPO-ED-06 No serious or irreversible change in water quality which may adversely impact on biodiversity, ecological integrity, social amenity or human health.		

5.9.2 Description of Hazard

Up to 7 exploration wells will be drilled over a period of ~10-15 days per well. The initial campaign will comprise of one well. Subsequent campaigns may include up to 2 wells per campaign. The activities will include cementing operations which will result in the discharge of:

- Cement slurry
- Spacer fluids
- Residual cement.

Cementing activities are described in Section 2.6.3. Cement is used to support well integrity and support the casing. Cementing activities include setting P&A plugs to abandon the well. During cementing of the surface casing and production casing excess cement will be discharged. Residual cement and wash water from flushing of equipment will be discharged. Cement spacer will also be discharged during cementing operations. If contingency activities (Section 2.6.5) are required during a campaign, additional discharges may be generated.

The discharge locations and approximate volumes of discharges resulting from cementing operations and contingency activities are listed in Table 2-8. Cement slurry (up to 10 m^3 per well)

and spacer fluids (up to 16 m^3 per well) will be released at the seabed. Residual cement (up to 16 m^3 per well) from line flushing will be released at the sea surface.

On completion of drilling activities, there may be barite, bentonite and cement remaining (Section 2.6.2.6). Disposal of these bulks will be determined based on options in order of preference (Figure 2-2). The option to discharge these materials overboard is the least preferred option and will only be considered if all other options are not determined to be viable. Offshore disposal of bulks will only occur following an ALARP workshop to determine that the impact of bulk discharge is acceptable. If dry bulks are discharged to the marine environment, they will be diluted into a slurry before discharge.

5.9.3 Impact and Risk Evaluation

Potential impacts from non-drilling material discharges include:

- Change in water quality
- Injury/mortality to benthic habitats and assemblages.

Potential risks to the environment from water quality changes include:

- Impacts to marine fauna arising from chemical toxicity.

The following receptors within the Operational Area may be impacted by drilling material discharges:

- Water quality
- Benthic habitats and assemblages.

5.9.3.1 Impact Assessment

Some fluids are discharged at the sea surface and some are discharged at the seabed. Due to the water depth in the Operational Area (50-60 m), water quality and benthic habitats may be impacted.

Change in Water Quality

Planned discharges of cement materials will result in changes in water quality and an increase in turbidity.

Cement is considered an inert substance and classed by OSPAR as posing little or no risk to the environment (PLONOR), so no toxicity impacts are expected. Barite and bentonite, like cement, are considered to be PLONOR and are given the OCNS ‘E’ grouping. Given their inert nature, these materials are not anticipated to cause increased toxicity in the marine environment.

Increased turbidity in the water column from discharge of cement materials will result in a temporary change in water quality. Particulate concentrations within a cement plume discharge have been shown to be 5-50 mg/L 2 hours after the discharge and < 5 mg/L 4 hours after the discharge (BP, 2013), showing the plume will rapidly disperse in well-mixed ocean waters. Given the total volume of cement materials to be released and the metocean conditions, the cement particles are expected to disperse and settle out of the water column.

Barite and bentonite are known to contain trace impurities of metals. A study of barite in seawater has noted that 1% of mercury and 15% of cadmium dissolved from the barite after one week (Crecelius et al., 2007). Given the low concentration of these components, discharge of these materials is not anticipated to have an adverse impact on water quality via metal dissolution.

Given the rapid dispersion expected in the open ocean and the low volume of discharges, the impact to water quality is expected to be highly localised and temporary. Water quality is expected to recover within hours of the activities finishing.

Benthic Habitats and Assemblages

Benthic habitat may be disturbed as a result of seabed discharges. During cementing operations, cement slurry (up to 10 m^3 per well) and spacer fluids (up to 16 m^3 per well) will be released at the seabed.

The discharged cement is considered inert and will not release any chemicals. It may set and remain inert and be considered to pose little or no toxicity risk to the marine environment. However, the cement may impact habitats and communities by smothering. A study of ~83 m^3 of cement discharged at the seabed showed that changes to the benthic environment was limited to a radius of ~10 m from the release site (BP, 2013). Given the volume of cement discharged during these activities is much smaller, the impact is anticipated to be localised to a small area around the release location.

Sediments in the Operational Area are likely to be sparsely populated by benthic infauna. The Operational Area does not overlap any KEFs and is not known to support any sensitive benthic populations.

No significant impacts are anticipated from the cement, or spacer fluids or cement slurries discharged due to the minor quantities, low toxicity of the material and the localised area of impact.

Impacts to Marine Fauna from Chemical Toxicity

An estimated 45 m^3 of each bulk material (i.e. cement, barite and bentonite) may remain at the end of the exploration drilling activities. If the bulk product is discharged (refer to Figure 2-2 for preferred disposal options) it will be discharged at the sea surface after being mixed into a slurry.

Cement is an inert substance and considered PLONOR. No toxicity impacts are expected from cement.

Barite and bentonite are considered PLONOR and are in the ‘E’ category under the OCNS. However, barite and bentonite are known to contain trace impurities of metals. A study of barite in seawater has noted that 1% of mercury and 15% of cadmium dissolved from the barite after one week (Crecelius et al., 2007). These metals present in barite have limited environmental mobility and low bioavailability (Neff, 2008; Schaaning et at., 2002). Barite is considered inert from a toxicological perspective.

The concentration of metal impurities in the bulks will be reduced by preparation of a slurry before release. The slurry will be further diluted in the open ocean, reducing the concentration of mercury and other metals to well below toxic levels.

Given the low concentration of these components and low solubility of barite and constituent metals, the presence of these heavy metals is anticipated to have a negligible impact on the environment. Impact on benthic invertebrates is considered limited given the low concentrations and discharge volumes.

5.9.4 Risk Ranking

Non-drilling material discharges are expected to result in highly localised and short-term changes to water quality. Due to the offshore oceanographic nature of the environment, the minimal volume, and low toxicity of the discharges, impacts to benthic assemblages present in the immediate vicinity of the discharge release are expected to be localised and short-term and not affect population functioning. Therefore:

- The consequence ranking of '1' (Incidental) was assigned to water quality and benthic habitat and assemblages, and a likelihood of 'E' (Almost Certain) was considered appropriate, resulting in a risk ranking of 'Medium' (RRIII).
- The consequence ranking of '1' (Incidental) was assigned to marine fauna, and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).

5.9.5 ALARP Demonstration

Table 5-38: Demonstration of ALARP – Non-drilling material discharges – Cement, cementing fluids, and unused bulk products

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
Chemical assessment and selection process	EPO-ED-06	Chemicals that will be discharged to the marine environment are selected in accordance with VOGA's Chemical Assessment Process (Section 8.3.7).	Completed chemical assessments show chemicals discharged to the marine environment meet the criteria of VOGA's Chemical Assessment Process (Section 8.3.7).
Prevention			
None identified	-	-	-

Reduction			
Unused bulk product managed as per Figure 2-2 at end of campaign.	EPO-ED-06	Unused bulk product managed as per Figure 2-2 at end of campaign.	Records demonstrate that the process outlined in Figure 2-2 was followed for the management of unused bulk product.
Mitigation			
None identified	-	-	-
Other			
Quality control for barite.	EPO-ED-06	Contaminant limit concentrations in barite: • Mercury (Hg) – 1 mg/kg dry weight in stock barite • Cadmium (Cd) – 3 mg/kg dry weight in stock barite.	Records show barite used for the drilling meets the below standard: • Mercury (Hg) – 1 mg/kg dry weight in stock barite • Cadmium (Cd) – 3 mg/kg dry weight in stock barite.
Monitoring use of barite and cement.	EPO-ED-06	Use of barite and cement will be monitored to reduce excess of bulk products remaining at end of campaign.	Records confirm that the use of barite and cement were monitored, and excess of bulk products were reduced to the minimum required.
Industry collaboration on management of unused bulk products.	EPO-ED-06	VOGA will • continue to be involved in industry collaboration efforts relating to the management of unused bulk products • implement improvements identified through industry-wide collaboration efforts if deemed ALARP following decision	Records demonstrate VOGA is involved in industry collaboration efforts and any improvements are implemented, if determined to be ALARP, following the decision framework in Figure 2-2.

		framework in Figure 2-2.	
Considered Control Measures	**Assessment of option**		**Decision**
Eliminate discharge of unused bulks	Any impact to the marine environment from discharge of bulks is minimal due to: • The nature of the materials – materials are considered inert or PLONOR, and barite has low solubility in the marine environment. • The marine environment – bulks disperse effectively in the offshore environment. Due to the presence of mercury in barite, compliance with Article 9 of the Minamata Convention has been addressed by considering best available techniques and best environmental practice, and subsequently developing the following control measures: • Unused bulk product managed as per Figure 2-2 at the end of campaign (CM-6.6) • Quality control of barite (CM-6.7) • Monitoring use of barite and cement (CM-6.8). CM-6.7 limits the concentration of mercury in barite and CM-6.8 reduces the volume of bulks remaining at the end of the campaign. Adopting these control measures reduces releases of mercury to the environment, as required by the Minamata Convention. The decision framework in CM-6.6 ensures all possible options are considered before bulks are released. Transport of dry bulks back to shore currently has an inherent increase in time, cost, and health and safety risk. Health and safety risks are increased due to transfer methodology for bulk products (pressured air used to “blow” bulks) into trucks which are not rated for the pressures with the potential for over-pressuring the receiving tank resulting in an explosion and fatalities. The environmental benefits of this control measure are limited, and currently, the associated health and safety risks are not justified.		Not adopted
ALARP Summary: The impacts from non-drilling material discharges are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-3), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA’s criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.			

5.9.6 Acceptability Demonstration

Table 5-39: Acceptability Demonstration – Non-drilling material discharges – Cement, cementing fluids, and unused bulk products

ACCEPTABLE LEVEL OF RISK DEMONSTRATED	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-38).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes – including: • VOGA chemical assessment process aligns with OSPAR list and OCNS guidance. • Mercury concentrations in barite will be limited in line with industry practice, to ensure compliance with article 9 of the Minamata Convention.
RR < High (RRII)	Yes – Medium (RRIII)
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-06 See Section 7 for further details.
Acceptability Summary The impacts from non-drilling material discharges have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-38), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.10 Unplanned: Accidental Overboard Loss of Waste and Solid Objects

5.10.1 Hazard report

Table 5-40: Hazard Report – Accidental discharge of waste and solid objects

HAZARD	Accidental overboard loss of waste and solid objects
EP risk number	EP-ED-R10
Activity/cause	MODU operations Support operations
Extent	Operational Area
Potential impact description	Localised, reversible and short-term impacts to benthic habitats and assemblages not affecting ecosystem functioning. Injury/mortality to marine fauna. Incidental impacts to submerged cultural heritage sites.

IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Benthic habitats	Incidental (1)	Possible (C)	Low (RRIV)
Marine fauna	Incidental (1)	Rare (A)	Low (RRIV)
Submerged cultural heritage	Incidental (1)	Rare (A)	Low (RRIV)
Relevant EPO(s)	EPO-ED-07 No unplanned discharge of waste or objects to the marine environment.		

5.10.2 Description of Hazard

During vessel operations an accidental loss of waste or solid objects may result from:

- Dropped equipment (anchor) from support vessels
- Dropped equipment during MODU operations and support vessels
- Waste accidentally released to the marine environment.

While there will be no planned transfer of equipment or large items between vessels during the activity, dropped objects may occur during rough seas where they are not able to be retrieved.

The handling and storage of waste on-board the MODU and support vessels has the potential for an accidental loss of waste or solid materials overboard. The transfer of waste material will only occur in port for appropriate disposal, however accidental releases may occur from rough seas or high winds.

5.10.3 Impact and Risk Evaluation

Potential risks caused by the accidental loss of waste or solid objects include:

- Impacts to benthic habitats and assemblages
- Injury/mortality to marine fauna
- Impacts to submerged cultural heritage.

The following receptors within the Operational Area may be impacted by accidental loss of waste or solid materials:

- Benthic habitats
- Marine fauna
- Cultural heritage.

5.10.3.1 Risk Assessment

Benthic Habitats

Change to Benthic Habitats

Unplanned disturbance to benthic habitats and assemblages may occur due to dropped objects overboard or during MODU operations and support vessels. These receptors may be smothered or disturbed due to sediment suspension and re-settlement. Benthic habitats within the Operational Area are likely to consist of fine silt and sandy substrates (Section 3.4.1.1). There is no seagrass, coral or macroalgal communities in the Operational Area.

Should the occurrence of dropped objects occur, the impact would be localised with limited disturbance to benthic habitats.

Marine Fauna

Injury/mortality

Accidental waste release into Commonwealth waters can cause injury or death to marine fauna through ingestion or entanglement. Marine fauna most at risk from marine pollution include fish, marine reptiles, seabirds, and marine mammals through ingestion or entanglement (CoA, 2017; DEE, 2018). Waste or marine debris encompasses all plastics and other types of debris that can harm marine wildlife. This includes plastic garbage (e.g. bags, bottles or ropes) and solid non-biodegradable materials lost or disposed of at sea. Ingestion or entanglement has the potential to limit feeding or foraging behaviours and thus can result in marine fauna injury or death. In 2003, “injury and fatality to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris” was listed as a key threatening process under the EPBC Act (DEE, 2018). The Threat Abatement Plan for the impacts of marine debris on the vertebrate wildlife of Australia’s coasts and oceans (DEE, 2018) identifies EPBC Act-listed species for which there are scientifically documented adverse impacts resulting from marine debris. Seabirds and marine turtles are particularly susceptible to the risks of marine plastics which may cause entanglement or be mistaken for food (CoA, 2017; DEE, 2018) and ingested causing damage to internal tissues and potentially preventing feeding activities, or potentially resulting in mortality to an individual. Marine debris has been identified as threat in the Recovery Plan for Marine Turtles in Australia (2017–2027). These impacts will be limited in exposure and quantity, affecting individual animals rather than population levels.

Threatened and/or migratory species potentially affected by the loss of waste overboard are discussed in Section 5.10. Recovery plans and species conservation advice for these species including albatrosses and giant petrels, seabirds, marine turtles, marine mammals, and the whale shark (Table 1-3) identify marine debris as a threat for the species. The Operational Area does not overlap any feeding or foraging areas for seabirds or marine turtles.

The Operational Area overlaps the Foraging BIA for the whale shark. The high-density aggregation area for the species is 276 km southwest of the Operational Area at the Ningaloo Marine Park and they are known to migrate further offshore along the 200 m depth contour. The Operational Area does not feature any upwelling or regions of high productivity. Therefore, whale shark presence in the area is likely to consist of individuals rather than any feeding aggregations.

Impacts to fish, birds, marine mammals and reptiles from unplanned accidental overboard loss of waste and solid objects is unlikely given the low occurrence of unplanned loss of waste and solid objects and the Operational Area located a significant distance from sensitive habitats. Any waste to the marine environment will be limited and managed with waste management plan and compliance with Marine Orders. Should any waste be lost to the sea during the activities, impacts are expected to be short-term not affecting species at a population level.

Submerged Cultural Heritage

Change to Submerged Cultural Heritage

Dropped objects may disrupt submerged cultural heritage, although there no known cultural heritage artefacts, shipwrecks or registered Aboriginal Cultural Heritage sites within the Operational Area (Section 3.6.3 and 3.7.5). Therefore, any impact to submerged cultural heritage is expected to be incidental.

5.10.4 Risk Ranking

An accidental loss of waste or solid object is expected to result in highly localised and temporary change to benthic habitats within the immediate vicinity of the release. Any impacts to marine fauna are expected to be short-term and not affect species at a population level. Therefore:

- The consequence ranking of '1' (Incidental) was assigned to benthic habitat, and a likelihood of 'C' (Possible) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).

5.10.5 ALARP Demonstration

Table 5-41: Demonstration of ALARP – Accidental discharge of waste and solid objects

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-
Prevention			
Non-hazardous and hazardous wastes are managed in accordance with contractor's Waste Management Plan.	EPO-ED-07	Hazardous and non-hazardous wastes shall be segregated into recyclable and non-recyclable in accordance with the vessel Waste Management Plan.	VOGA audit or inspection confirms hazardous and non-hazardous wastes are segregated into recyclable and non-recyclable wastes. Compliance records from VOGA's waste management audit.
		Waste shall be stored in clearly marked containers, and hazardous wastes bunded, in accordance with the relevant	VOGA inspection or audit confirms compliance.

		Safety Data Sheet (SDS) and the vessel Waste Management Plan.	
		Wastes for onshore disposal shall be transported in suitable containers as outlined in the vessel Waste Management Plan.	Inspection or audit confirms waste is transported onshore in relevant containers.
		All non-hazardous (except putrescible waste and waste-water) and hazardous waste shall be transported to shore and disposed of in appropriately licensed facilities in accordance with the vessel Waste Management Plan.	Waste disposal receipts confirm appropriate disposal of wastes (type and volume).
MODU and vessel inductions include control measures and training for crew in dropped object prevention.	EPO-ED-07	Crew training/inductions, and job safety analyses where relevant, will include a component on preventing dropped objects to increase awareness of requirements in accordance with Section 8.3.6.	Records show training to minimise the potential for dropped objects is provided to the MODU and vessel(s) crew.
Reduction			
MODU and vessel procedures are compliant with MARPOL Convention Annex V, Prevention of Pollution by Garbage from Ships and Marine Order 95.	EPO-ED-07	All vessels/MODU licensed to carry more than 15 persons or over 400 gross tonnage shall have and implement a Waste Management Plan and maintain a Garbage Record Book in accordance with MARPOL Convention Annex V, Prevention of Pollution by Garbage from Ships and Marine Order 95.	VOGA inspection or audit of MODU and vessels to ensure compliance with Waste Management Plan. Garbage Record Book details the wastes (type and volume) disposed.
MODU work procedures for lifts, bulk transfers and cargo loading.	EPO-ED-07	MODU work procedures require: • The security of loads to be checked prior to commencing lifts • Loads to be covered if there is a risk of losing loose materials • Lifting operations to be conducted using systems to manage the specific risks of that lift, including consideration of weather and sea state.	Completed handling and transfer procedure checklist, Permit to Work and/or risk assessments verify that the procedure is implemented prior to each transfer.

Mitigation			
Recovery of dropped objects where practical to do so.	EPO-ED-07	Any hazardous solid waste dropped to the marine environment will be recovered where safe and practicable to do so. Where safe and practicable for this activity, consider: • Risk to personnel to retrieve object • Whether the location of the object is in recoverable water depths • The object's proximity to subsea infrastructure • Ability to recover the object (i.e. nature of object, lifting equipment or ROV availability, and suitable weather).	Incident reports detail the recovery attempt consideration and status of any hazardous waste lost to the marine environment.
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
None identified	-		-
ALARP Summary: Application of the described control measures ensures that the risk of dropped objects are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-4), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.			

5.10.6 Acceptability Demonstration

Table 5-42: Acceptability demonstration – Accidental discharge of waste and solid objects

Acceptable level of impact/risk demonstrated	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (see Table 5-41).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes – including: • AMSA Marine Order 95 • Threat Abatement Plan for the Impacts of Marine Debris on Vertebrate Wildlife of Australia's Coasts and Ocean (DEE, 2018)

	• Approved Conservation Advice for *Charadrius mongolus* (Lesser sand plover) (TSSC, 2016) • National Recovery Plan for albatrosses and petrels (2022) (DCCEEW, 2022) • Approved Conservation Advice for *Rhincodon typus* (whale shark) (TSSC, 2015b) • Conservation Advice for *Orcaella heinsohni* (Australian snubfin dolphin) (DCCEEW, 2025b) • Conservation Advice for *Sousa sahulensis* (Australian humpback dolphin) (DCCEEW, 2025c) • Recovery plan for the Australian Sea Lion (*Neophoca cinereal*) (DSEWPaC, 2013a) • Recovery Plan for Marine Turtles in Australia, 2017-2027 (Commonwealth of Australia, 2017) • Approved Conservation Advice for *Dermochelys coriacea* (Leatherback Turtle) (DEWHA, 2008c).
RR < High (RRII)	Yes – Low (RRIV).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-07 See Section 7 for further details.
Acceptability Summary: The impacts of accidental loss of waste and solid objects have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-41), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.11 Unplanned: Introduction of Invasive Marine Species

5.11.1 Hazard report

Table 5-43: Hazard Report – Introduction of Invasive Marine Species

HAZARD	Introduction of Invasive Marine Species (IMS)		
EP risk number	EP-ED-R11		
Activity/cause	Vessel operations MODU operations		
Extent	Operational Area		
Potential impact description	Changes to habitat structure. Displacement of native marine species or a reduction in abundance from predation, competition or interspecies breeding. Interaction with industry.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Benthic habitats	Moderate (3)	Rare (A)	Low (RRIV)
Industry	Moderate (3)	Rare (A)	Low (RRIV)

Relevant EPO(s)	EPO-ED-08 No introduction, establishment or spread of a known or potential IMS.

5.11.2 Description of Hazard

IMS are marine plants or animals that are not native to Australia but have been introduced by human activities such as shipping (DAFF, 2021).

The AHTS vessels contracted to support MODU operations may be sourced from domestic or international waters. Support vessels will be transferring various materials to the MODU and will typically be contracted for the duration of each campaign (15–20 days per well). A maximum of 3 AHTS will be within the Operational Area at one time.

The physical presence of the MODU and support vessels required to undertake the activities associated with the exploration drilling activities have the potential to result in the introduction of IMS within the Operational Area. Vessels sourced internationally will carry a greater risk than vessels source domestically.

The 2 primary vectors for introduction of IMS relevant to the activity are through biofouling and ballast water (DAWR, 2018), which are discussed in Section 5.11.2.1 and Section 5.11.2.2.

5.11.2.1 Ballast Water

Ballast water is held in the ballast tanks of vessels and ensures safe operating conditions are maintained by providing stability. When vessels require ballast, water from the surrounding environment is pumped into the ballast tanks. This water has the potential to be contaminated with microorganisms such as bacteria, microbes, small invertebrates, eggs, cysts and larvae of various species. When the weight of the vessel needs to be lightened ballast water is released into the receiving marine environment resulting in the potential introduction of foreign organisms. It is estimated that up to 30% of all marine pest incursions in Australia have arrived via ballast water (DAWR, 2018).

The Commonwealth Department of Agriculture, Fisheries and Forestry (DAFF) is the lead agency for management of ballast water. Vessels are required to manage ballast water in accordance with IMO Ballast Water Management (BWM) Convention, IMO Guidelines, the mandatory Australian Ballast Water Management Requirements (DAWE, 2020) that is enforced under the *Biosecurity Act 2015*. The Australian Ballast Water Management Requirements set out the obligations on vessel operators with regards to the management of ballast water and ballast tank sediment when operating within Australian seas.

The requirements provide guidance for vessel operators on best practice policies and apply to all vessels operating internationally and domestically in Australia.

- All vessels must carry a valid ballast water management plan, a valid International Ballast Water management certificate and maintain a complete and accurate record of all ballast water movements.
- Vessels with a Ballast Water Management System (BWMS) must carry a Type Approval Certificate specific to the type of BWMS installed.

Vessels that are intending to discharge internationally sourced ballast water must submit a Ballast Water Report through the Maritime and Aircraft Reporting system (MARS) at least 12 hours prior to arrival.

Domestic vessels that have been released from biosecurity control are still required to manage the movement of Australian sourced ballast water.

All ballast water should be managed using one of the approved ballast water management options. All ballast water must be managed or receive a low-risk exemption from the department prior to discharge.

No ballast water discharge or exchange is expected to occur within the Operational Area.

5.11.2.2 Biofouling

Biofouling occurs when an accumulation of organisms attach and grow on immersed surfaces (e.g. ship hulls) and/or within internal seawater circulation systems.

DAFF is the lead agency for management of Biofouling on vessel hulls, external niche areas and immersible equipment in Australian waters. Under the National Biofouling Management Guidelines for the Petroleum Production and Exploration Industry, IMO Guidelines for the control and management of ships' biofouling to minimise the transfer of invasive aquatic species (resolution MEPC.207(62)) and Australian Biofouling Management Requirements (DAFF, 2023) a risk assessment approach is applied to manage biofouling. IMO biofouling guidelines are considered ‘best practice’ for mitigation of transfer of IMS to ALARP.

All contracted vessels are required to complete the VOGA Biofouling Risk Assessment Process described in Section 8.3.8. The VOGA Biofouling Risk Assessment Process assigns a final risk category of low, moderate, uncertain or high to vessels based on a range of information including last port of call, age of antifouling coating etc. If a risk category of moderate, uncertain or high is scored, a range of management options are available including inspections, cleaning or treatment of internal seawater systems.

5.11.3 Impact and Risk Evaluation

Potential risks from the activity caused by the introduction of IMS include:

- Changes to habitat structure
- Displacement of native marine species or a reduction in abundance from predation, competition or interspecies breeding
- Interaction with industry.

The following receptors within the Operational Area may be impacted by introduction of IMS:

- Benthic habitats and communities
- Offshore infrastructure.

5.11.3.1 Risk Assessment

IMS are organisms that have established within a marine environment outside of their natural area of distribution and impact on local ecosystems. Not all marine species introduced into an area have the potential to establish themselves and become invasive. Species of concern are those that are not native to the region, are likely to survive and establish in the region, and are able to spread by human mediated or natural means. Species of concern vary from one region to another depending on various environmental factors such as water temperature, salinity, nutrient levels and habitat type. These factors dictate their survival and invasive capabilities.

IMS pose a major threat to the Australian environment, economy and social amenity by disrupting ecological processes. Disruption can occur via 2 pathways:

- Directly – through predation or competing with native marine plants and animals
- Indirectly – through habitat alteration (DAWR, 2018).

Australia's marine tourism industry has an annual value of around $14 billion, while marine industries (for example, commercial fisheries and aquaculture, and oil and gas extraction) are expected to contribute $100 billion to the national economy each year by 2025 (DAWR, 2018).

Once established, marine pests can rarely be eradicated, and their negative effects are often long lasting.

Benthic Habitats and Communities

Change to Benthic Habitats

It has been found that highly disturbed environments (such as marinas) are more susceptible to colonisation than open-water environments (Paulay et al., 2002). Of the 60 species known to have become established in WA, only 6 are tropical species that occur north of Shark Bay (Wells et al., 2009). Most IMS are concentrated in port areas and relatively few have expanded their range beyond these presumed introductory points (Wells et al., 2009). Further, modelling conducted by the Bureau of Rural Sciences (BRS) of ballast water found that the risk of IMS colonisation decreases with an increased distance to shore (BRS, 2007), with only 2% chance of colonisation at 24 nm from shore or beyond.

Benthic habitats within the Operational Area as described in Section 3.4.1.1 are defined by communities associated with subtidal soft sediments. ROV studies at similar depths within the NWS found that although sediments were variously bioturbated, benthic communities were generally sparse with low densities of organisms (e.g. crustaceans, molluscs, and polychaetes). Further, no key ecological features, often associated with hard substrate habitats are located within the Operational Area.

The Operational Area is located in a deep-water (50 – 60 m) open-ocean environment with a lack of hard substrate that is ~35 km (19 nm) from the nearest shoreline (i.e. islands of the Dampier Archipelago). Therefore, it is considered that the Operational Area does not provide a location conducive to marine pest establishment and survival and that there is little potential for invasive organisms to accumulate and multiply.

Industry

The greatest potential for the establishment of IMS resulting from project activities is associated with the potential for colonisation of subsea infrastructure which provide attachment points for sessile invertebrates or marine algae closer to the sea surface where light availability is greater.

Exploration drilling activities will occur within the WA-14-L permit which currently contains the Wandoo B platform, the Wandoo A unmanned monopod, and a variety of subsea systems associated with 16 production wells. Further, the Scarborough Export pipeline and the North Rankin to Withnell Bay pipeline both run through parts of the permit.

Water depths of the Operational Area range between 50–60 m. Although subsea infrastructure is present within the vicinity of activities, light availability will be limited. In the event of introduction of IMS within the Operational Area and establishment of Wandoo infrastructure, the introduction is likely to remain localised due to the isolation of the facility.

In the event that an IMS colonises the environment as a result of activities, a control strategy will be developed and implemented, in consultation with IMS experts and DAFF.

5.11.4 Risk Ranking

The deep offshore open waters of the Operational Area are not conducive to the settlement and establishment of IMS (Geiling, 2014), due to the lack of light and suitable habitat to sustain growth and survival. Therefore:

- A consequence ranking of ‘3’ (Moderate) was assigned to benthic habitats, industry, commercial fishing and recreational fishing, and likelihood of ‘A’ (Rare) was considered appropriate, resulting in a risk ranking of Low (RRIV).

5.11.5 ALARP Demonstration

Table 5-44: Demonstration of ALARP – Introduction of Invasive Marine Species

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-
Prevention			
Australian Ballast Water Management Requirements (DAWE, 2020) consistent with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast	EPO-ED-08	Vessels will have an approved ballast water management plan and valid ballast water management certificate, unless an exemption applies or is obtained, as specified in the Australian Ballast Water Management Requirements.	Ballast water management plan or record of exemption. Valid ballast management certificate or record of exemption.

Water Management Convention) (IMO, 2004).			
MODU and Vessels comply with the Annex 1 of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships.	EPO-ED-08	Anti-fouling systems on the MODU and support vessels are maintained in compliance with International Convention on the Control of Harmful Anti-Fouling Systems on Ships (IMO, 2001): • Prohibits the use of harmful organotins in antifouling paints used on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.	Records indicate MODU and vessel anti-fouling systems have not used harmful organotins.
MODU, vessel and immersible equipment complete the VOGA Biofouling Risk Assessment Process consistent with National Biofouling Guidelines for the Petroleum Production and Exploration Industry and IMO Guidelines for the control and management of a ships' biofouling to minimise the transfer of IMS.	EPO-ED-08	MODU and support vessels will complete a VOGA Biofouling Risk Assessment, identifying a low risk before mobilisation to the Operational Area. Biofouling risk based on a range of information including presence of a biofouling management plan and record book, last port of call, age of anti-fouling coating, etc. If a risk category of moderate, uncertain or high is scored, the process requires an independent IMS expert to be engaged and further risk assessment and/or management measures undertaken.	Records of VOGA Biofouling Risk Assessments maintained for MODU and support vessels and relevant immersible equipment entering the Operational Area demonstrating low risk status. Records of management measures implemented if required, through the IMS vessel risk assessment process.
Reduction			
None identified	-	-	-
Mitigation			
None identified	-	-	-
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
Mandatory dry docking of vessels prior to entering field to clean vessel and equipment and remove biofouling.	Practice would ensure that no IMS are present on vessel or associated equipment. Significant cost (grossly disproportionate to the risk); would lead to scheduling delays.		Not adopted.

Restrict vessel operations to using vessels and equipment that have only operated in local, State or Commonwealth waters to reduce potential for IMS introduction.	Would reduce potential for IMS to be transported into area since vessels would not have originated elsewhere. Vessels and equipment suitable for the activity that have only operated in local, State or Commonwealth waters may not be available; therefore, work could not be completed.	Not adopted.
ALARP Summary: Application of the described control measures ensures that the risk of introduction of marine species are ALARP, based on the risk assessment outcomes using VOGA Risk Matrix (as per Table 4-5), the ALARP template to determine the appropriate decision context type (Table 4-2) and VOGA's criteria for demonstrating ALARP (Section 4.2). Through the ALARP process, additional controls have been identified that would further reduce the impacts without disproportionate sacrifice.		

5.11.6 Acceptability Demonstration

Table 5-45: Acceptability demonstration – Introduction of Invasive Marine Species

Acceptable level of impact/risk demonstrated	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-44)
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes – including: • Australian Ballast Water Management Requirements (DAWE, 2020) and the Australian Biofouling Management Requirements (DAFF, 2023) give effect to the *Biosecurity Act 2015* and associated regulations; International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Convention) and relevant guidelines or procedures adopted by the Marine Environment Protection Committee of the IMO. • National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (MPSC, 2018).
RR < High (RRII)	Yes – Low (RRIV).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-08 See Section 7 for further details.
Acceptability Summary: The risk of introduction of IMS has been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-43), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.12 Unplanned: Physical Presence – Interaction with Marine Fauna

5.12.1 Hazard report

Table 5-46: Hazard Report – Physical presence – Interaction with marine fauna

HAZARD	Physical Presence – Interaction with Marine Fauna		
EP risk number	EP-ED-R12		
Activity/cause	Vessel operations		
Extent	Operational Area		
Potential impact description	Injury/mortality to marine fauna.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Fish, sharks and rays	Incidental (1)	Unlikely (B)	Low (RRIV)
Marine mammals	Incidental (1)	Unlikely (B)	Low (RRIV)
Marine reptiles	Incidental (1)	Unlikely (B)	Low (RRIV)
Relevant EPO(s)	EPO-ED-09 No serious or irreversible harm to a threatened or migratory listed species.		

5.12.2 Description of Hazard

The physical presence of the activity vessels required to undertake the exploration drilling activities have the potential to cause temporary displacement of marine fauna and in unlikely circumstances even result in collisions. Where there is a collision between the vessel (hull and propellers) and marine fauna, it may result in injury or mortality. It is anticipated that the MODU legs will not present a strike hazard to marine fauna as they are stationary and readily detected and avoided by marine fauna.

Factors that contribute to the frequency and severity of impacts from vessel interactions with marine fauna vary and depend on the vessel type, vessel operation (specific activity, speed), physical environment (e.g. water depth), the type of animal potentially present and their behaviours.

A maximum of two wells will be drilled within a single campaign. Each well is estimated to take 15-20 days to complete (including all activities). Therefore, the maximum duration that vessels are expected to be present within the Operational Area is 15-20 days per well. A maximum of 3 AHTS support vessels may be active within the Operational Area at one time.

Whilst undertaking activities in the Operational Area vessels would typically be stationary or operating at low speeds when supporting the exploration drilling activities. Support vessels typically transit to and from the Operational Area up to 3 times per week (e.g. to port).

5.12.3 Impact and Risk Evaluation

Potential risks caused by the physical presence of vessels include:

- Disruption to marine fauna
- Injury/mortality to marine fauna.

The following receptors within the Operational Area may be impacted by the physical presence of vessels:

- Fish, sharks and rays
- Marine reptiles
- Marine mammals.

5.12.3.1 Risk Assessment

Slow-moving marine fauna present in surface waters, such as marine turtles, whale sharks, dugongs, and cetaceans, are most at risk to vessel strike due to their proximity to the vessel (hull, propeller or equipment) and their limited ability to avoid vessels (i.e. diving). Vessel collision can cause serious injury and/or mortality to individuals that are impacted. The National Strategy for Reducing Vessel Strike of Marine Megafauna identifies cetaceans and marine turtles as being the most vulnerable to vessel strikes (Commonwealth of Australia, 2017a). Other marine fauna species, including seabirds, marine mammals (dolphins and seals) and fish species (including sharks and rays), are likely to avoid any moving vessels and are considered at low risk of potential vessel strike.

Fish, Sharks and Rays

Injury/Mortality to Marine Fauna

Large, slow moving fish species that are known to spend considerable time close to the surface, such as whale sharks, have been identified to be more vulnerable to vessel strike. Smaller fish may also be at risk of injury or mortality from vessels by getting caught in thrusters during station keeping operations (i.e. DP). However, this is unlikely given the large distribution and low density of individuals, combined with the avoidance behaviour commonly displayed by pelagic fish during station keeping operations.

Vessel strikes are recognised as a key threat to recovery by the Approved Conservation Advice for whale sharks (TSSC, 2015c). A foraging BIA (northward from Ningaloo along the 200 m isobath) for whale sharks is overlapped by the Operational Area (Section 3.4.4). The species therefore may occur seasonally within the Operational Area as they are known to aggregate around Ningaloo between March and July each year to feed (DCCEEW, 2025). Whale sharks reportedly spend 40% of their time in the upper 15 m of the water column and approximately 25% of their time within 2 m of the sea surface increasing their vulnerability to vessel strike (Wilson et al., 2006; Gleiss et al., 2013). Collision has been identified to be plausible with both smaller vessels as well as larger commercial vessels that have drafts greater than 20 m below the surface.

Vessels contracted by VOGA operating within the Operational Area will be required to maintain safe distances from any whale sharks sighted defined by the Biodiversity Conservation Regulations 2018 (WA) to minimise exposure (Table 5-47).

Given vessel activity is limited to within the Operational Area, the duration of activities is short-term and temporary and the slow speeds at which project vessels operate, collisions with individual whale sharks are considered highly unlikely.

Marine Mammals

Injury/Mortality to Marine Fauna

Cetaceans are naturally inquisitive marine mammals that are often attracted to offshore vessels, and dolphins commonly 'bow ride' with offshore vessels. The reaction of whales to the approach of a vessel is quite variable with a variety of behaviours observed by humpback whales and other cetaceans including longer dive times and movements away from the vessel's path with increased speed (Baker and Herman, 1989; Meike et al., 2004). Data compiled from vessel strikes records occurring from 1997 to 2015 in Australian waters from the International Whaling Commission (IWC) global database indicated that marine mammals, particularly the humpback whale, have the highest frequency of collisions (Peel et al., 2016).

Cetaceans typically spend more time at the surface when resting, foraging, nursing or mating (CoA, 2017a). Individuals engaged in these biologically important activities have been noted to be distracted whilst undertaking these activities, subsequently making them less likely to avoid an approaching vessel and more vulnerable to vessel collision (Laist et al., 2001). When the vessels are stationary or slow moving, the risk of collision with cetaceans is extremely low. Laist et al. (2001) identifies that larger vessels moving in excess of 10 knots may cause fatal or severe injuries to cetaceans with the most severe injuries caused by vessels travelling faster than 14 knots.

Whilst several species of marine mammals may be present within the Operational Area there are no known key aggregation areas (resting, breeding or feeding) located within or immediately adjacent. However, as identified in Section 3.4.4 a migration BIA for the humpback whale does overlap with the Operational Area. Although exploration drilling activities may occur during the humpback whale southbound and northbound migratory periods (see Section 3.4.3.5) the potential for interaction is considered unlikely due to the slow speeds that project vessels will be operating at within the Operational Area.

Further, vessels contracted by VOGA operating within the Operational Area will also be required to maintain safe distances from any marine mammals sighted and must have procedures that adhere to Part 8 of EPBC Regulation 2000 to minimise exposure of marine mammals (Table 5-47).

Given vessel activity is limited to within the Operational Area, the duration of activities is short-term and temporary and the slow speeds at which project vessels operate, collisions with individual marine mammals are considered highly unlikely and will not result in negative impacts to the population, or ecosystem function.

Marine Reptiles

Injury/Mortality to Marine Fauna

Marine turtles transiting within the Operational Area are at risk from vessel strike when they periodically return to the surface to breathe and rest. Marine turtles spend as little as 3 to 6 percent of their time at the surface with routine dives times lasting anywhere between 15 and 20 minutes to an hour depending on environmental conditions (NOAA, 2021). However, the Recovery Plan for Marine Turtles in Australia (CoA, 2017) identifies vessel strike as a threat to marine turtles, particularly in shallow coastal foraging habitats and internesting areas, where there are high numbers of recreational and commercial vessels.

Whilst several species of marine turtles may be present within the Operational Area, only one species has an identified BIA (Section 3.4.4). An internesting buffer BIA for the flatback turtle overlaps with the Operational Area. A modelling study for internesting flatback turtles in the NWS was conducted to identify areas of suitable habitat within the region. The study found that water depths of 0–16 m within 5–10 km of the coast were preferred with all 47 female turtles remaining within water depths <44 m, with a mean depth of <10 m (Whittock et al., 2016). It was further defined that waters >25 m and >27 km from the coast were unsuitable (Whittock et al., 2016).

Therefore, although the Operational Area overlaps an Internesting BIA, it is located >27 km from the coast and within water depths that are classified as unsuitable for internesting (50-60 m). It is expected that any presence of marine turtles would be limited to transient individuals and that responses to vessel presence would result in avoidance behaviours.

5.12.4 Risk Ranking

Vessel movements will occur within the Operational Area, introducing the potential for vessel collisions with marine fauna. However, given the slow transit times, temporary presence of the vessels whilst undertaking the activities, and low presence of marine fauna BIAs found within the Operational Area, any disruption to behavioural patterns and potential injury/mortality to marine fauna is considered unlikely. Therefore:

- The consequence ranking of ‘1’ (Incidental) was assigned to marine fauna, with a likelihood of ‘B’ (Unlikely), resulting in a risk ranking of ‘Low’ (RRIV).

5.12.5 ALARP Demonstration

Table 5-47: Demonstration of ALARP – Physical presence – Interaction with marine fauna

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-

Prevention			
Vessels contracted by VOGA operating in the Operational Area must adhere to Part 8 of EPBC Regulation 2000 to minimise exposure of marine fauna.	EPO-ED-09	Compliance with EPBC Regulations 2000 – Part 8 Division 8.1 (Regulation 8.05 and 8.06) which requires that: • A vessel will not travel greater than 6 knots within 300 m of a whale (caution zone) and not approach closer than 100 m from a whale. • A vessel will not approach closer than 50 m of a dolphin or 100 m of a whale (with the exception of animals bow-riding). • A vessel will not approach closer than 300 m to a calf (whale or dolphin) (the caution zone) • If a calf appears in the caution zone the vessel must be immediately stopped and must: – turn off the vessel's engines, or disengage the gears, or withdraw the vessel from the caution zone at a constant speed of less than 6 knots.	Records demonstrate no breaches of EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans.
Vessels contracted by VOGA operating in the Operational Area must adhere to separation distances defined by the Biodiversity Conservation Regulations 2018 (WA) to minimise exposure of marine fauna.	EPO-ED-09	Compliance with Biodiversity Conservation Regulations 2018 (WA) which requires that: • A vessel will maintain a separation distance of 30 m from a whale shark.	Records demonstrate no breaches of the separation distances defined for whale sharks with the Biodiversity Conservation Regulations 2018 (WA).
Reduction			
None identified	-	-	-
Mitigation			
None identified	-	-	-
Other			
None identified	-	-	-

Considered Control Measures	Assessment of option	Decision
Environmental induction.	Reduces the risk of collision with megafauna by training key personnel (e.g. bridge crew) to understand and adhere to: • Part 8 of the EPBC Regulations • Separation distance defined for the whale shark within the Biodiversity Conservation Regulations 2018 (WA). Cost considered proportionate to the environmental benefit.	Adopted (refer to Table 7-2).
Use of dedicated MMOs on project vessels.	The potential impact to marine fauna is considered incidental, so implementing dedicated MMOs will not reduce the risk significantly. Cost considered disproportionate given no significant environmental benefit.	Not adopted.
Vessels to adopt measures outlined in Part 8 of EPBC Regulation 2000 to other receptors e.g., marine turtles and whale sharks.	Given the low tow speed of the MODU (maximum 5 knots), interactions between vessels and marine turtles, and whale sharks are considered to be unlikely. In addition, VOGA has been the operator of Wandoo since 2005 and have no history of vessel strikes.	Not adopted.
ALARP Summary: Application of the described control measures ensures that the risk of interaction with marine fauna are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-4), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). Through the ALARP process, additional controls have been identified that would further reduce the impacts without disproportionate sacrifice.		

5.12.6 Acceptability Demonstration

Table 5-48: Acceptability demonstration – Physical presence – Interaction with marine fauna

Acceptable level of impact/risk demonstrated	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-47).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes – including: • Compliance with Part 8 of the EPBC Regulation 2000. • Compliance with separation distances defined for whale sharks within the Biodiversity Conservation Regulations 2018 (WA). • Approved Conservation Advice for *Rhincodon typus* (whale shark) (TSSC, 2015c) • Approved Conservation Advice for *Balaenoptera borealis* (Sei Whale) (TSSC, 2015d)

	• Approved Conservation Advice for *Balaenoptera physalus* (Fin Whale) (TSSC, 2015e) • Conservation Management Plan for the Blue Whale, 2015-2025 (DoE, 2015b) • Conservation Advice for *Orcaella heinsohni* (Australian snubfin dolphin) (DCCEEW, 2025b) • Conservation Advice for *Sousa sahulensis* (Australian humpback dolphin) (DCCEEW, 2025c) • National Recovery Plan for the Southern Right Whale (DCCEEW, 2024o) • Recovery plan for the Australian Sea Lion (*Neophoca cinereal*) (DSEWPaC, 2013a) • Recovery Plan for Marine Turtles in Australia, 2017-2027 (Commonwealth of Australia, 2017) • Approved Conservation Advice for *Dermochelys coriacea* (Leatherback Turtle) (DEWHA, 2008c)
RR < High (RRII)	Yes – Low (RRIV).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-09 See Section 7 for further details.
Acceptability Summary: The potential risks from the physical presence of vessels of interaction within marine fauna have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-47), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.13 Unplanned: Minor Spills

5.13.1 Hazard report

Table 5-49: Hazard Report – Minor spills

HAZARD	Minor Spills		
EP risk number	EP-ED-13		
Activity/cause	MODU operations Vessel operations		
Extent	Operational area		
Potential impact description	Temporary decline in marine water quality. Localised toxic effects to marine fauna		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Water quality	Incidental (1)	Unlikely (B)	Low (RRIV)
Marine fauna	Incidental (1)	Unlikely (B)	Low (RRIV)
Relevant EPO(s)	EPO-ED-10		

	No unplanned discharge of hydrocarbons or chemicals to the marine environment. EPO-ED-11 Impacts to values and sensitivities are minimised in the event of a loss of hydrocarbons.

5.13.2 Description of Hazard

During exploration drilling activities, the MODU and support vessels will be present within the Operational Area. Minor spills may occur from the MODU and vessel equipment, bulk storage, or packaged chemicals (deck spill). The types of fluids on board vessels range from lubricating fluids to hydraulic, fuel and cooling fluids. Maintenance chemicals and lubricating oils are stored in fit-for-purpose containers. Inboard leaks could be generated from any of the wide range of equipment on the MODU and vessels. The leaks may come from a failure of a mechanical component, fitting or hose. Waste lube oil from mud pumps, compressors, equipment crankcases and drip pans drains into the dirty-oil holding tank.

Leaks from inboard fittings and connections would be contained within bunded areas, which drain to a sump through the closed drain system. Any spill to deck will be cleaned up using absorbents. Therefore, spills into the marine environment are considered highly unlikely.

5.13.3 Impact and Risk Evaluation

The accidental release of a minor spill of chemicals or hydrocarbons may result in:

- A change in water quality.

The potential risks from a change in water quality caused by an accidental release of chemicals or hydrocarbons include:

- Injury / mortality to marine fauna.

5.13.3.1 Impact Assessment

Water Quality

Change in Water Quality

The accidental release of a minor spill of chemicals and hydrocarbons into the marine environment has the potential to cause a localised reduction in the receiving marine environment. A visible oil sheen on the water surface may also occur in the event of minor hydrocarbon spills. However, the hydrocarbons that have the potential to release, such as hydraulic oil, are highly volatile and will evaporate rapidly after being released, due to natural processes. Any change in the water quality following a minor spill is anticipated to be highly localised, within the immediate vicinity of the release and result in short-term impacts which rapidly recovers.

Project chemicals will be selected in accordance with VOGA's Chemical Assessment and Selection Process, as described in Section 8.3.6.3. The drilling fluids to be used will be water-based hydrocarbons, classified under the OCNS as Class D or E, which are typically non-

persistent. These hydrocarbons have been used widely in marine environments worldwide with no observed environmental effect.

See Section 5.14 for the impact assessment of a larger accidental hydrocarbon release of MDO.

Marine Fauna

Injury/Mortality to Marine Fauna

As a result of a change in water quality from an unplanned minor spill of hydrocarbons or chemicals, further impacts to receptors may occur, which include potential injury or mortality to marine fauna. Given that surface discharges are rapidly dispersed, and subsea discharges (from ROVs) would be of small volumes, potential impacts would be highly localised and temporary. Therefore, the potential for toxicity to marine fauna will be extremely rare as the temporary exposure will preclude toxic effects.

See Section 5.14 for the impact assessment of a larger accidental hydrocarbon release of MDO.

5.13.4 Risk Ranking

A minor spill is expected to result in highly localised and temporary change to water quality within the immediate vicinity of the release. Due to the offshore oceanographic nature of the environment, the minimal volume, and low toxicity of the spill, impacts to water quality and to marine fauna are expected to be localised and short-term. Therefore,

- The consequence ranking of '1' (Incidental) was assigned to water quality, and a likelihood of B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).
- The consequence ranking of '1' (Incidental) was assigned to marine fauna and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).

5.13.5 ALARP Demonstration

Table 5-50: Demonstration of ALARP – Minor spills

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
Helicopter refuelling on the MODU is not planned while it is jacked up on location in the Operational Area.	EPO-ED-10	No helicopter refuelling on the MODU or vessels in the Operational Area.	MODU and vessel log books confirm no helicopter refuelling occurred.
Substitution			
None identified	-	-	-
Prevention			
Chemical storage on MODU and vessels compliant with MODU and vessels contractor's storage requirements to	EPO-ED-10	All hazardous chemicals shall be stored in bunded areas or below deck to prevent release to marine environment.	VOGA inspection or audit process confirms chemical storage will prevent release of chemicals

prevent release to marine environment.			to the marine environment.
Contractor's PMS includes hydraulic hose, vessel listing equipment and cranes maintenance and replacement schedule.		All hydraulic hoses, vessel lifting equipment and cranes shall be serviced in accordance with the relevant Contractor's PMS and replacement schedule. Contractor's servicing and maintenance records shall be validated by VOGA to ensure they are up to date.	VOGA inspection or audit confirms application of contractor's PMS during MODU pre-hire inspection.
Contractor's PMS includes all MODU and AHTS vessel equipment including lifting equipment and cranes.		MODU and AHTS vessel lifting equipment and cranes shall be serviced and certified in accordance with the relevant Contractor's PMS. Contractor's servicing and maintenance records shall be validated by VOGA to ensure they are up to date.	VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.
Reduction			
None identified	-	-	-
Mitigation			
MODU and vessels will implement a SOPEP/SMPEP in the event of a spill.	EPO-ED-11	SOPEP/SMPEP (equivalent to class) procedures shall be available during drilling activities.	VOGA inspection or audit confirms SOPEP/SMPEP (equivalent to class) procedures are available on the vessels during drilling activities.
MODU and vessels have equipment to manage small deck spills.		Equipment meeting the requirements of the SOPEP/ SMPEP (equivalent to class) shall be available on the vessels during drilling activities.	VOGA inspection or audit confirms appropriate spill kits are available during drilling activities.
Decision making processes support mitigation of environmental impact of spills and assessment of effectiveness of response strategies.		The Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] shall provide a process for completing an IAP which shall include: • An environmental impact assessment of the proposed response activities • Selection of the most appropriate response activities (strategies)	Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].

		• Identification of appropriate operational and scientific monitoring activities • Operational and scientific monitoring outputs shall inform the effectiveness of response strategies.	
The Wandoo Field OSCP describes incident management system and interfaces.		• Organisational structure and roles and responsibilities of Incident Control Team (ICT) members are defined in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016]. • Interfaces between the VOGA ICT and the command teams representing State and Commonwealth Oil Spill Response Agencies are described in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
None identified	-		-
ALARP Summary: Application of the described control measures ensures that the risk of interaction with marine fauna are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-3), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). VOGA will adopt standard industry good practice controls. No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.			

5.13.6 Acceptability Demonstration

Table 5-51: Acceptability demonstration – Minor spills

Acceptable level of impact/risk demonstrated	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-50).
External context – objections or claims considered	N/A – no external objections or claims received.

Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy.
Other requirements met	Yes – Potential spills to be managed in accordance with SOPEP/SMPEP (equivalent to class).
RR < High (RRII)	Yes – Low (RRIV).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-10 • EPO-ED-11 See Section 7 for further details.
Acceptability Summary: The potential risks from a minor spill have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-50), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.14 Unplanned: Accidental Release of Marine Diesel Oil

5.14.1 Hazard report

Table 5-52: Hazard Report – Accidental release of marine diesel oil

HAZARD	Accidental release of MDO		
EP risk number	EP-ED-R14		
Activity/cause	Vessel operations		
Extent	Extent of the Hydrocarbon Area (MDO) and EMBA (MDO).		
Potential impact description	Temporary decline in marine water quality. Injury or death of exposed marine fauna. Potential impacts where the spill reaches sensitive marine areas such as coral reefs or sandy/rocky shorelines.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Water quality	Moderate (3)	Unlikely (B)	Medium (RRIII)
Benthic habitats	Minor (2)	Unlikely (B)	Low (RRIV)
Coastal communities	Moderate (3)	Unlikely (B)	Medium (RRIII)
Marine fauna	Minor (2)	Unlikely (B)	Low (RRIV)
Protected and significant areas	Minor (2)	Unlikely (B)	Low (RRIV)
Other marine users	Minor (2)	Unlikely (B)	Low (RRIV)
First nations	Moderate (3)	Unlikely (B)	Medium (RRIII)
Relevant EPO(s)	EPO-ED-10 No unplanned discharge of hydrocarbons or chemicals to the marine environment. EPO-ED-11 Impacts to values and sensitivities are minimised in the event of a loss of hydrocarbons.		

5.14.2 Description of Hazard

An accidental release of MDO fuel could potentially occur from the collision of the activity vessels with another vessel or Wandoo infrastructure. Vessel collisions typically occur as a result of:

- Mechanical failure/loss of DP system
- Navigational error
- Foundering due to weather.

The maximum duration that the vessels are expected to be present within the Operational Area is 20 days for each well. Two AHTS support vessels are typically contracted for the duration of each campaign. A third vessel of similar or lesser specifications may also be used during rig moves and to provide additional logistical support. As such, a maximum of three vessels may be active within the Operational Area at any one time throughout the duration of each campaign (Section 2.10.1).

5.14.2.1 Spill Modelling

Stochastic spill modelling was undertaken to determine the trajectory of the worst-case credible accidental release of MDO (RPS, 2024). The spill modelling was carried out using a purpose-developed oil spill trajectory and fates model, SIMAP (Spill Impact Mapping Analysis Program). This model is designed to simulate the transport and weathering processes that affect the outcomes of hydrocarbon spills to the sea, accounting for the specific oil type, spill scenario, and prevailing wind and current circulation patterns (RPS, 2024). Table 5-53 summarises the spill model inputs and parameters.

The maximum volume of the single largest fuel tank (based upon 100% capacity) aboard an AHTS is approximately 300 m^3 (Table 2-9). As suggested by AMSA (2013), the maximum credible spill scenario was identified by using this maximum volume of the largest fuel tank (300 m^3) to ensure a conservative scenario was modelled.

Table 5-53: Summary of the oil spill model settings used by RPS (2024)

Model settings	Scenario	
Scenario type	Accidental release of MDO	
Location	Kullingal (the Prospect Area closest to Dampier)	
	Latitude*	Longitude*
	20° 10' 16.32" S	116° 24' 11.88" E
No. of spill simulations	100 per season	
Period	Summer (October to February) Winter (April to July) Transitional (March, August and September)	
Spill volume	300 m^3	
Oil type	MDO	
Release depth	0 m (surface)	
Release duration	6 hours	

Model settings	Scenario
Simulation length	30 days

**Datum: WGS 1984*

Hydrocarbon Characteristics

MDO is categorised as a group II oil (light-persistent) according to the AMSA (2023) classifications. The classification is based on the specific gravity of hydrocarbons in combination with relevant Boiling Point (BP) ranges. It is important to note that some of the heavier components contained in the MDO (i.e. low volatile and persistent portions) will have a strong tendency to physically entrain into the upper water column in the presence of moderate winds (i.e. >12 knots) and breaking waves but can re-float to the surface if these energies abate. The low viscosity (14 cP) indicates that this oil will spread quickly when released and will form a thin to low thickness film on the sea surface, increasing the rate of evaporation.

Generally, about 4% of the MDO mass should evaporate within the first 12 hours (BP < 180°C); a further 32% should evaporate within the first 24 hours (180°C < BP < 265°C); and an additional 54% should evaporate over several days (265°C < BP < 380°C). Approximately 10% (by mass) of MDO will not evaporate, though will decay slowly over time (RPS, 2024).

Table 5-54 summarises the physical characteristics for MDO.

Table 5-54: Hydrocarbon characteristics for MDO (RPS, 2024)

Hydrocarbon characteristics		MDO	
Hydrocarbon Type		Marine Diesel (MDO)	
API		27.4	
Density (kg/m^3)		890.0 (at 15 °C)	
Dynamic viscosity (cP)		14.0 (at 25 °C)	
Pour point (°C)		-9.0	
Hydrocarbon property category		Group II	
Hydrocarbon property classification		Light persistent	
Hydrocarbon Component		Boiling point (°C)	% of Total
Volatiles	Non- persistent	<180	4.0
Semi-volatiles		180-265	32.0
Low volatiles		265-380	54.0
Residual	Persistent	>380	10.0

Weathering and Fate

A series of weathering tests were conducted (RPS, 2024) to illustrate the potential behaviour following a 50 m^3 instantaneous surface release of MDO when exposed to:

- 5 knot (2.6 m/s) constant wind speed, 27°C water temperature and currents
- Variable wind speeds (1 – 12 m/s or 2 to 23 knots), 27°C water temperature and currents.

The first case is indicative of the potential weathering rates under calm conditions that would not generate entrainment, while the second case would be more representative of the moderate winds experienced over the region.

The mass balance forecast for the constant wind case (Figure 5-1) shows that 36.1% of the MDO is predicted to evaporate within 24 hours. The remaining MDO on the water surface will weather at a slower rate and be subject to more gradual decay through biological and photochemical processes (RPS, 2024).

For the variable wind speed case (Figure 5-2), after 24 hours, 80.5% of the mass of MDO will have entrained, with an additional 15.0% expected to have evaporated. Hence, only a <1% of floating oil remains on the water surface. The low volatile and residual compounds are anticipated to entrain beneath the surface under conditions generating wind waves (winds approximately > 6 m/s). While the MDO is entrained, it is forecast to decay at a higher rate of 3% per day or 21% after 7 days, attributed to biological and photochemical degradation. This contrasts with a rate of 0.14% per day and a total of ~1% after 7 days for the constant-wind case. Given the proportion of entrained MDO and its tendency to remain mixed in the water column, the remaining hydrocarbons are expected to undergo decay over several weeks (RPS, 2024).

Figure 5-1: Mass balance plot for an instantaneous 50 m^3 surface release of MDO subjected to a constant 5 knot (2.6 m/s) wind, currents and 27°C water temperature (RPS, 2024)

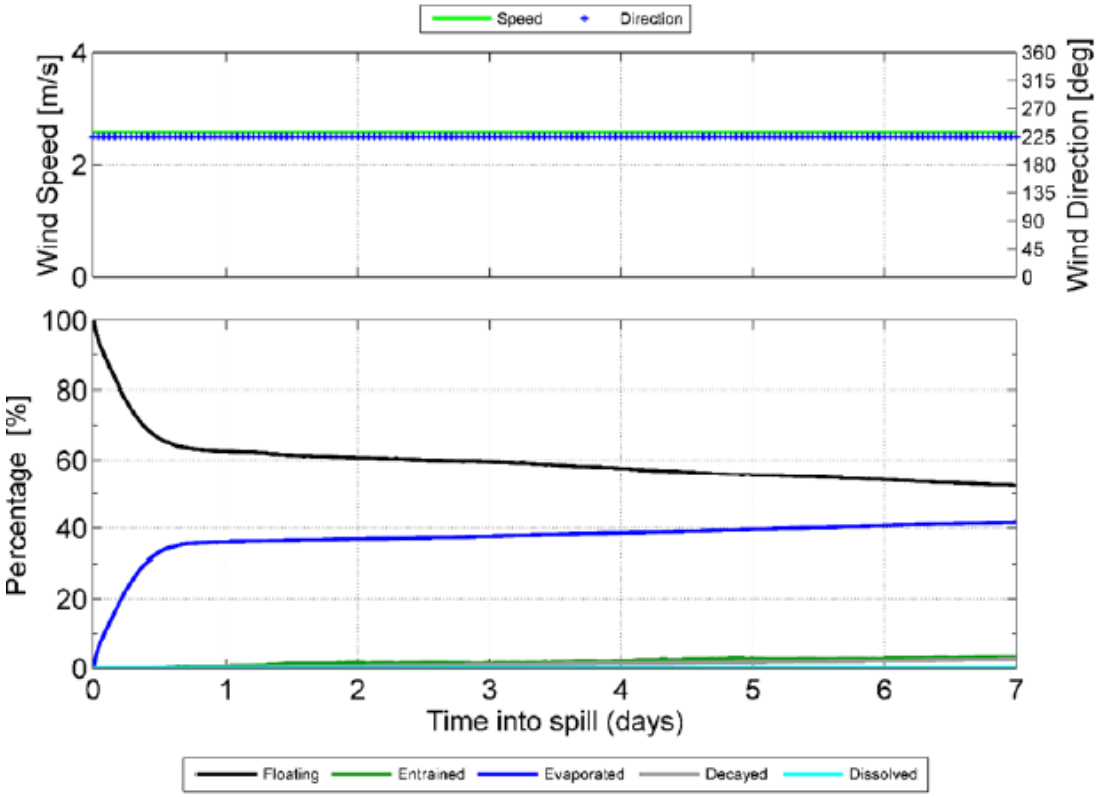
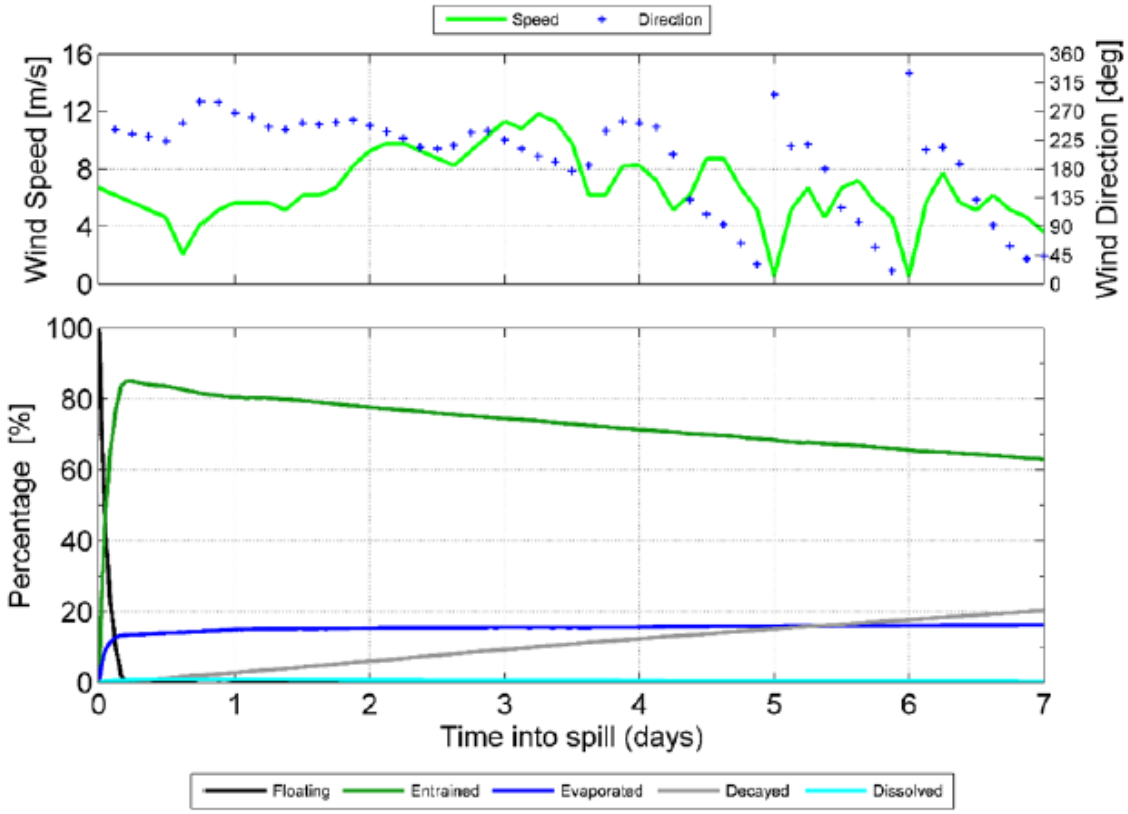


Figure 5-2: Mass balance plot for an instantaneous 50 m³ surface release of MDO subjected to variable wind speeds of 2 to 23 knots (1 – 12 m/s), currents and 27°C water temperature (RPS, 2024)



Exposure Thresholds

The SIMAP model tracks oil concentrations to very low levels, therefore it is important to define meaningful threshold concentrations for the recording of contact by oil components and determining the probability of exposure at a location (calculated from the number of replicate simulations in which this contact occurred). The thresholds for surface, shoreline, and in-water oil (dissolved and entrained) used in this EP are based on those outlined by NOPSEMA in the Oil Spill Modelling Bulletin (NOPSEMA, 2019), which are summarised in Table 5-55.

Table 5-55: Hydrocarbon threshold levels (NOPSEMA, 2019)

Exposure level	Threshold	Description
Surface oil		
Low	1 g/m²	Approximates range of socio-economic effects and establishes planning area for scientific monitoring
Moderate	10 g/m²	Approximates lower limit for harmful exposures to birds and marine mammals
High	50 g/m²	Approximates surface oil slick and informs response planning
Shoreline oil accumulation		
Low	10 g/m²	Predicts potential for some socio-economic impact
Moderate	100 g/m²	Loading predicts area likely to require clean-up effort

Exposure level	Threshold	Description
High	1,000 g/m^2	Loading predicts area likely to require intensive clean-up effort
Dissolved in-water oil		
Low	10 ppb	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
Moderate	50 ppb	Approximates potential toxic effects, particularly sublethal effects to sensitive species
High	400 ppb	Approximates toxic effects including lethal effects to sensitive species
Entrained in-water oil		
Low	10 ppb	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
High	100 ppb	As appropriate given oil characteristics for informing risk evaluation

Modelling Results

Table 5-56 provides a summary of the results from the stochastic modelling report (RPS, 2024; Appendix B) for an accidental release of MDO.

Table 5-56: Summary of the hydrocarbon modelling results for an accidental release of MDO (RPS, 2024)

Exposure values	Summary of worst-case predicted exposure
Surface exposure	
Low (1 g/m^2)	The maximum distance for floating surface hydrocarbon exposure at this threshold from the source was predicted to be 31 km. No exposure was predicted to any receptor(s) at this threshold.
Moderate (10 g/m^2)	The maximum distance for floating surface hydrocarbon exposure at this threshold from the source was predicted to be 18 km. No exposure was predicted to any receptor(s) at this threshold.
High (50 g/m^2)	The maximum distance for floating surface hydrocarbon exposure at this threshold from the source was predicted to be 6 km. No exposure was predicted to any receptor(s) at this threshold.
Shoreline exposure	
Low (10 g/m^2)	The highest probability of hydrocarbon accumulation on any shoreline at or above the low threshold was 24%. The minimum time to shore at or above the low threshold was 91 hours (Barrow Island, Lowendal Islands and Montebello Islands). The maximum total volume of hydrocarbon ashore for a single spill trajectory was 23.2 m^3. The maximum length of hydrocarbon ashore above the low threshold was 14 km (across Barrow Island and Montebello Islands).
Moderate (100 g/m^2)	The highest probability of hydrocarbon accumulation on any shoreline at or above the moderate threshold was 6%.

Exposure values	Summary of worst-case predicted exposure
	The minimum time to shore at or above the moderate threshold was 110 hours (Montebello Islands). The maximum total volume of hydrocarbon ashore for a single spill trajectory was 20.3 m^3. The maximum length of hydrocarbon ashore above the moderate threshold was 6 km (Montebello Islands).
High (500 g/m^2)	No exposure at this threshold was predicted.
In-water exposure - dissolved	
Low (10 ppb)	The maximum distance for dissolved hydrocarbons at this exposure from the source was predicted to be 169 km. The minimum time to dissolved hydrocarbon exposure at any given receptor(s) was 27 hours (Montebello AMP). The probability of intersect with the Montebello AMP is 7%.
Moderate (50 ppb)	The maximum distance for dissolved hydrocarbons at this exposure from the source was predicted to be 58 km. The minimum time to dissolved hydrocarbon exposure at any given receptor(s) was 51 hours (Montebello AMP). The probability of intersect with the Montebello AMP is 1%.
High (400 ppb)	No exposure at this threshold was predicted.
In-water exposure - entrained	
Low (10 ppb)	The maximum distance for entrained hydrocarbons at this exposure from the source was predicted to be 494 km. The minimum time to dissolved hydrocarbon exposure at any given receptor(s) was 22 hours (Montebello AMP). The probability of intersect with the Montebello AMP is 54%.
High (100 ppb)	The maximum distance for entrained hydrocarbons at this exposure from the source was predicted to be 237 km. The minimum time to dissolved hydrocarbon exposure at any given receptor(s) was 23 hours (Montebello AMP). The probability of intersect with the Montebello AMP is 24%.

5.14.3 Impact and Risk Evaluation

The accidental release of MDO may result in:

- A change in water quality.

The potential risks from a change in water quality caused by the accidental release of MDO include:

- Change in marine fauna behaviour
- Injury/mortality to marine fauna
- Change in ecosystem dynamics and conservation values

- Changes to the functions, interests, or activities of other marine users
- Change in submerged cultural heritage.

The following receptors within the Operational Area may be impacted:

- Plankton
- Benthic habitats
- Coastal communities
- Marine fauna, such as:
  - plankton
  - benthic invertebrates
  - seabirds and shorebirds
  - fish, sharks and rays
  - marine mammals
  - marine reptiles
- Protected and significant areas
- Social and economic environment, such as:
  - fisheries and aquaculture
  - other marine users
- First Nations values.

5.14.3.1 Risk Assessment

Water Quality

Change in Water Quality

The accidental release of MDO into the marine environment as a result of vessel collision will result in a localised reduction in the water quality within the receiving marine environment. A visible oil sheen on the water surface may also occur in the event of a hydrocarbon spill.

As discussed in Section 3.3.2 the marine water quality within the Hydrocarbon Area (MDO) and EMBA (MDO) is expected to be representative of the typically pristine and high-water quality found in offshore WA waters. Water quality surveys undertaken in 2003 identified no detectable hydrocarbons; with BTEX, PAH and Total Petroleum Hydrocarbon (TPH) below the laboratory LOR (Wenziker et al., 2006). The hydrocarbon modelling predicted that the maximum distance for floating surface hydrocarbon exposure at any threshold would extend out to 31 km, and 169 km and 494 km for dissolved and entrained hydrocarbons, respectively (Table 5-56; RPS, 2024). Therefore, changes to water quality will occur outside of the Operational Area in the unlikely event of a vessel collision.

Due to the highly dispersive environment typical of the offshore area, and the rapid weathering expected for the light non-persistent hydrocarbon, with approximately 15 – 36.1% evaporated within 24 hours depending on the conditions (Section 5.14.2.1), any change to water quality is

expected to be short-term and will recover to pre-spill state as the hydrocarbon weathers. The consequence ranking of '3' (Moderate) was assigned to a change in water quality due to the extent of the spill outside the Operational Area.

Benthic Habitats

Benthic habitats have been assessed based on the hydrocarbon exposure at the thresholds that have the potential to cause ecological impacts (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using moderate hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved) and the high hydrocarbon exposure for in-water (entrained) hydrocarbons. This is defined as the Hydrocarbon Area (MDO).

Table 5-57 evaluates the potential impact that hydrocarbon spills for this activity may have on benthic habitat receptors found within the Hydrocarbon Area (MDO).

Table 5-57: Risk assessment for an accidental release of MDO – benthic habitats and communities

Benthic habitats and communities
Exposure evaluation:
The seafloor in the Hydrocarbon Area (MDO) is comprised of fine silt/sand substrates with low densities of benthic communities. The seafloor of the deeper waters of the NWS is primarily a soft sediment habitat that can support scavengers, benthic filter feeders and epifauna communities (Brewer et al., 2007). Any areas of exposed hard substrate are likely to be colonised by deep water filter-feeding organisms, such as hydroids and sponges. Biologically significant coral reef formations are found within the Hydrocarbon Area (MDO), such as hard corals found at Montebello Islands. Seagrasses are found through shallower areas of the Hydrocarbon Area (MDO). Montebello Island contain sparse seagrass habitat (McMahon et al., 2017), however the closest known key areas of seagrass habitat to the Operational Area is the Exmouth Gulf and Ningaloo Reef area, outside of the Hydrocarbon Area (MDO). Macroalgae is widespread within shallower hard substrate areas within the Hydrocarbon Area (MDO). Due to the widespread nature of macroalgal habitat within the Hydrocarbon Area (MDO), there are no identified areas of significant environmental value. The maximum distance for dissolved hydrocarbons at moderate exposure (50 ppb) from the source was predicted to be 58 km and 237 km for entrained hydrocarbons at the high threshold (100 ppb). In general, only a small number of residual oil types are sufficiently dense enough to sink when spilled into the marine environment. Typically hydrocarbons with an API value less than 7 will be denser and may sink in seawater, and an API less than 10 will be denser for freshwater and may sink (EPA, 2006). The API for MDO is usually 27.4 (Table 5-54), as such it will float on the surface or remain suspended within the water column (typically within 0–10 m) when released into the marine environment. The hydrocarbon will only sink if it is mixed with denser sediments resulting in sedimentation to occur. This can be common in areas of large tidal action (ITOPF, 2024).
Predicted impact:
In-water
<u>Corals</u> Exposure of entrained hydrocarbons to shallow subtidal corals has the potential to result in lethal or sublethal toxic effects, resulting in acute impacts or death at moderate to high exposure thresholds (Shigenaka, 2011). Contact with corals may lead to reduced growth rates, tissue decomposition, impaired fertilization and larval settlement, and poor resistance and mortality of sections of reef (NOAA, 2010a). In-water exposure (dissolved or entrained) at relevant exposure thresholds is typically only predicted to occur within the upper 0–10 m of the water column, therefore, corals found in water depths below 10 m are not anticipated to be impacted by in-water hydrocarbon exposure. <u>Seagrass</u> In-water exposure (dissolved or entrained) is only predicted to occur within the upper 0–10 m of the water column; therefore, benthic habitat, such as seagrass, within intertidal or shallow nearshore waters has the potential to be exposed.

Benthic habitats and communities
Intertidal and subtidal seagrass ecosystems can be damaged in a number of ways. Exposure also can take place via uptake of hydrocarbons through plant membranes and seeds may be affected by contact with oil contained within sediments (NRDA, 2012). Petroleum fractions absorbed into the seagrass tissues, can also lower the organism's tolerance to other stressors and reduce growth rates (Zieman et al., 1984; Runcie et al., 2010). Entrained hydrocarbon within the water column can affect light qualities and the ability of macrophytes, including seagrasses and macroalgae, to photosynthesise. <u>Macroalgae</u> In-water exposure (entrained and dissolved) is only predicted to occur within the upper 0-10 m of the water column; therefore, benthic habitats, such as macroalgae, within intertidal or shallow nearshore waters has the potential to be exposed. Due to the hydrocarbon properties of MDO, as a light non-persistent hydrocarbon, toxicity is expected to be a more significant threat to macroalgae communities compared to physical smothering from heavier oils. The toxicity of hydrocarbons to macroalgae varies for the different macroalgal life stages, with water-soluble hydrocarbons more toxic (Van Overbeek and Blondeau, 1954; Kauss et al., 1973; cited in O'Brien and Dixon, 1976). Toxic effect concentrations for hydrocarbons and algae have varied greatly among species and studies, ranging 0.002–10,000 ppm (Lewis and Pryor, 2013). The sensitivity of gametes, larva and zygote stages, however, have all proven more responsive to oil exposure than adult growth stages (Thursby and Steele, 2004; Lewis and Pryor, 2013). Entrained hydrocarbon within the water column can also affect light qualities and the ability of macrophytes, including seagrasses and macroalgae, to photosynthesise.
Predicted impact summary:
Given the restricted range of exposure for benthic communities; restricted to shallow nearshore and intertidal waters only, outside of the main exposure area predicted within 0 – 10 m of the sea surface, the rapid weathering of the hydrocarbon expected following a spill release (Section 5.14.2.1), and the predicted low concentrations of hydrocarbons expected to reach these waters, any impacts to benthic habitats and associated communities is anticipated to be localised and short-term, with rapid recovery expected. As such, a consequence ranking of '2' (Minor) was assigned.

Coastal Communities

Coastal communities have been assessed based on the hydrocarbon exposure based on the thresholds that have the potential to cause ecological impacts (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using moderate hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved) and the high hydrocarbon exposure for in-water (entrained) hydrocarbons. This is defined as the Hydrocarbon Area (MDO).

Table 5-58 evaluates the potential impact that hydrocarbon spills for this activity may have on coastal receptors found within the Hydrocarbon Area (MDO).

Table 5-58: Risk assessment for an accidental release of MDO – coastal communities

<table>
<tr><th colspan="3">Mangroves</th></tr>
<tr><td colspan="3">Exposure evaluation:</td></tr>
<tr><td colspan="3">A few isolated regionally significant mangrove communities are found within the Hydrocarbon Area (MDO), such as along the coastline of Barrow Island and the Montebello islands.
The spill modelling identified that the highest probability of hydrocarbon accumulation on any shoreline at or above the moderate threshold (100 g/m^2) was 6% at Montebello Islands. The minimum time to shore was 4.5 days (110 hours) and the maximum total volume of hydrocarbon ashore for a single spill trajectory was 20.3 m^3 (Section 5.14.2.1). Montebello Island also recorded the maximum length of hydrocarbon ashore above the moderate threshold (6 km).</td></tr>
<tr><td colspan="3">Predicted impact:</td></tr>
<tr><td>Surface</td><td>In-water</td><td>Shoreline</td></tr>
<tr><td>Mangroves are considered to have a high sensitivity to hydrocarbon exposure. The severity of exposure for mangroves depends on the amount and type of oil entering the intertidal zone (Duke, 2016). In contrast to heavy oil, lighter oils with low specific gravity, such as MDO and condensates, are more toxic to mangroves (Hensel et al., 2014; Connolly et al., 2020).
The potential for toxicity effects from hydrocarbons may be reduced by weathering processes that should serve to lower the content of soluble aromatic components before contact occurs.</td><td>The change in toxicity levels within the marine environment can penetrate the root surfaces, via the respiratory capabilities of the roots, poisoning the plant.
Mangroves can also take up in-water hydrocarbons from contact with leaves, roots or sediments, and it is suspected that this uptake causes defoliation through leaf damage and tree death (Wardrop et al., 1987).
Acute impacts to mangroves can be observed within weeks of exposure, whereas chronic impacts may day months to years to detect.</td><td>Oil can enter mangrove forests when the tide is high and be deposited on the aerial roots and sediment surface as the tide recedes. This process commonly leads to a patchy distribution of the oil and its effects because different places within the forests are at different tidal heights (IPIECA 1993; NOAA, 2014b).</td></tr>
<tr><td colspan="3">Predicted impact summary:</td></tr>
<tr><td colspan="3">Isolated coastal mangroves communities that may be exposed to hydrocarbons within the Hydrocarbon Area (MDO) are located at Montebello Island.
Given the non-persistent nature of MDO, as a light non-persistent hydrocarbon, the distance to the nearest mangrove communities from the release location (83 km southwest of the Operational Area), and the anticipated weathering that the hydrocarbon will undergo prior to impact with the minimum time to shoreline accumulation predicted after 4.5 days (Section 5.14.2.1), any impact to mangroves are anticipated to be highly localised, with hydrocarbons highly weathered prior to exposure.</td></tr>
</table>

Despite impacts predicted to be limited, given their sensitivity to hydrocarbons, the potential consequence to mangroves is assessed conservatively based on the potential for localised, medium-term impacts, to species or habitats of recognized conservation value or to local ecosystem function. As such, a consequence ranking of '3' (Moderate) was assigned.
Saltmarsh
Exposure evaluation:
Saltmarsh habitat is common within tidal flats or wetland habitats within the wider EMBA (MDO) area, with very few isolated saltmarsh habitats present just outside of the Hydrocarbon Area (MDO), along the coastline of Barrow Island (Figure 3-6). The probability of shoreline contact for Barrow Island was only predicted at the low threshold, with no contact predicted for moderate thresholds.
Predicted impact:
Shoreline
Saltmarsh is considered to have a high sensitivity to hydrocarbon exposure. Hydrocarbon (in liquid form) will readily adhere to the marshes, coating the stems from tidal height to sediment surface. However, heavy oil coating is unlikely due to the highly volatile nature of the condensate hydrocarbon. Evidence from case histories and experiments shows that the damage resulting from oiling, and recovery times of oiled marsh vegetation, are highly variable. In areas of light to moderate oiling where oil is mainly on perennial vegetation with little penetration of sediment, the shoots of the plants may be killed but recovery can be relatively rapid, occurring the following growing season or earlier (Hester and Mendelssohn, 2000).
Predicted impact summary:
Given saltmarsh habitats only occur at Barrow Island within the wider EMBA (MDO) and that the modelling did not predict shoreline accumulation to occur at Barrow Island at the moderate hydrocarbon threshold (RPS, 2024), impacts to saltmarshes following the accidental release of MDO are expected to be negligible. As such, a consequence ranking of '1' (Incidental) was assigned.
Rocky and sandy beaches
Exposure evaluation:
Intertidal beaches and mudflats, sandy beaches, rocky beaches and rocky shorelines and reef platforms occur in island shores within the wider EMBA (MDO) region. The highest probability of hydrocarbon accumulation on any shoreline within the Hydrocarbon Area (MDO) was predicted to occur at the Montebello Islands (6%) within 110 hours. The maximum length of hydrocarbon ashore above the moderate threshold was 6 km at the Montebello Islands. The spill modelling did not predict shoreline contact at the moderate threshold to occur at Barrow Island or any mainland shoreline locations (RPS, 2024). Sandy beaches are a dominant coastal shoreline on the Montebello Islands, with patchy of rocky beaches and rocky limestone outcrops.

Predicted ompact:
Shoreline
Hydrocarbons can become concentrated as it strands ashore. However, most of the oil is concentrated along the high tide mark while the lower/upper parts are often untouched (IPIECA, 1994). Sandy shoreline Sandy beaches provide habitat for a diverse assemblage (although not always abundant) of infauna (including nematodes, copepods and polychaetes); and macroinvertebrates (e.g. crustaceans). A sandy beach may also allow oil to percolate through the sand, thus increasing its ability to hold more oil ashore over tidal cycles and various wave actions than an equivalent area of water; hence oil can increase in thickness onshore over time. The viscosity of the oil will influence how likely it will percolate into the sand. For example, lower viscosity oils, such as condensates and MDO, are more likely to permeate into sand areas compared to heavier, highly viscous oils. The influence of tidal action and wave washing are expected to lead to increase levels of weathering of any hydrocarbons in the intertidal area and reduce the level of smothering or toxicity effects to exposed fauna along shorelines. Rocky shoreline/intertidal reef platforms The sensitivity of a rocky shoreline to oiling is dependent on a number of factors including its topography and composition, position, exposure to oceanic waves and currents etc. Exposed rocky shorelines have been shown to be less sensitive than sheltered rocky shorelines. Rocky shorelines provide habitats for invertebrates (e.g. sea anemones, sponges, sea-squirts, molluscs), and can also be utilised b bird species; noting that foraging and breeding/nesting typically occurs above high tide line. The impact of oil on any organism depends on the toxicity, viscosity and amount of oil, on the sensitivity of the organism and the length of time it is in contact with the oil. Even where the immediate damage to rocky shores from oil spills has been considerable, it is unusual for this to result in long-term damage and the communities have often recovered within 2 or 3 years (IPIECA, 1995).
Predicted impact summary:
Given the low probability of the worst-case shoreline exposure (6%) (Section 5.14.2.1), the weathering expected for the light non-persistent hydrocarbon, and the tidal action and constant wave washing on this type of shoreline which would contribute to further weathering of any hydrocarbons in the intertidal shoreline area, any impacts to shorelines from exposure to MDO are anticipated to be localised and short-term. As such, a consequence ranking of ‘2’ (Minor) was assigned.

Marine Fauna

Marine fauna has been assessed based on the hydrocarbon exposure based on the thresholds that have the potential to cause ecological impacts (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using moderate hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved) and the high hydrocarbon exposure for in-water (entrained) hydrocarbons. This is defined as the Hydrocarbon Area (MDO).

Table 5-59 evaluates the potential impact that hydrocarbon spills for this activity may have on marine fauna receptors found within the Hydrocarbon Area (MDO).

Table 5-59: Risk assessment for an accidental release of MDO - marine fauna

<table>
<tr><th colspan="2">Plankton</th></tr>
<tr><td colspan="2">Exposure evaluation:</td></tr>
<tr><td colspan="2">Plankton has been identified as a receptor that may be present within the Hydrocarbon Area (MDO).
As discussed in Section 3.4.3.1, plankton migrate vertically through the water column to feed in surface waters at night and, when doing so, may be exposed to surface hydrocarbons and, to a greater extent, hydrocarbons dissolved or entrained in the water column (NRDA, 2012).
Plankton species are known to be sensitive to the toxic effects of oil at low concentrations and large numbers of planktonic organisms may be affected in the event of a spill event (ITOPF, 2014). Plankton risk exposure through ingestion, inhalation and dermal contact.</td></tr>
<tr><td colspan="2">Predicted impact:</td></tr>
<tr><td>Surface</td><td>In-water</td></tr>
<tr><td>Phytoplankton (photosynthetic organisms) can accumulate rapidly, due to their small size and high surface area to volume ratio, therefore populations are typically not sensitive to the impacts of oil (Hook et al., 2016). However, if phytoplankton are exposed to hydrocarbons at the sea surface, their ability to photosynthesise via smothering may be directly affected and would have implications for the next trophic level in the food chain (e.g. small fish) (Hook et al., 2016).</td><td>Zooplankton (protozoans and animals) are vulnerable to hydrocarbons due to their small size and high surface area to volume ratio. Some zooplankton also have high lipid content, which facilitates hydrocarbon uptake and bioaccumulation (Hook et al., 2016). Water column organisms that come into contact with oil risk exposure through ingestion, inhalation and dermal contact (NRDA, 2012), can cause immediate mortality or declines in egg production, hatching rates and a decline in swimming speeds (Hook et al., 2016).
However, any direct effects on plankton communities from spilled hydrocarbons is expected to be localised and temporary, as reproduction by survivors or migration from unaffected areas is likely to rapidly replenish any losses (Volkman et al., 1994). Furthermore, the proximity of nutrient-rich seasonal upwelling events which occur within the vicinity will further assist recovery rates.
Once background water quality conditions have re-established, the plankton community may take weeks to months to recover due to short generation times (ITOPF, 2011a), allowing for seasonal influences on the assemblage characteristics.</td></tr>
<tr><td colspan="2">Predicted impact summary:</td></tr>
<tr><td colspan="2">Plankton populations are numerous and widespread and expected to rapidly recover following an accidental release of MDO.</td></tr>
</table>

Due to the highly dispersive environment of the offshore environment, and the rapid weathering expected for the MDO, 15-36.1% within 24 hours, depending on weather conditions (Section 5.14.2.1), any impacts to plankton from exposure to MDO are anticipated to be localised and short-term, with rapidly recovery expected. As such, a consequence ranking of '2' (Minor) was assigned.
Benthic invertebrates
Exposure evaluation:
Benthic invertebrates may present within the Hydrocarbon Area (MDO) and may be exposed to hydrocarbons following an accidental release of MDO. The benthic invertebrates within the Hydrocarbon Area (MDO) are anticipated to be comparable to similar sites within the NWS region, of low abundance but highly diverse species, comprised largely of polychaete worms, crustaceans, echinoderms, and molluscs. (Rainer, 1991).
Predicted impact:
In-water
Entrained and dissolved hydrocarbons can have negative impacts on marine invertebrates and associated larval forms. Impacts to some adult species (e.g. crustaceans) is reduced as a result of the presence of an exoskeleton, while others with no exoskeleton and larval forms may be more prone to impacts. Exposure to microscopic oil droplets may also impact aquatic biota either mechanically (especially filter feeders) or act as a conduit for exposure to semi-soluble hydrocarbons (that might be taken up by the gills or digestive tract) (French-McCay, 2009). Toxicity is primarily attributed to water soluble PAHs, specifically the substituted naphthalene (C2 and C3) as the higher C-ring compounds become insoluble and are not bioavailable. Localised impacts to larval stages may occur which could impact population recruitment. If invertebrates are contaminated by hydrocarbons, tissue taint can remain for several months, although taint may eventually be lost. For example, it has been demonstrated that it took 2-5 months for lobsters to lose their taint when exposed to a light hydrocarbon (NOAA, 2002). Other possible impacts from the presence of dispersed and non-dispersed oil include effects of oxygen depletion in bottom waters due to bacterial metabolism of oil (and/or dispersants), and light deprivation under surface oil (NRDA, 2012). Water quality in benthic habitats exposed to entrained hydrocarbons would be expected to return to background conditions within weeks to months of contact. Several studies have indicated that rapid recovery rates may occur even in cases of heavy oiling (National Academies Press, 2003).
Predicted impact summary:
Due to the characteristics of the light, non-persistent hydrocarbons, and associated water depths, coating of benthic assemblages and prolonged exposure to hydrocarbons is considered highly unlikely following a release of MDO. Furthermore, the highly dispersive environment of the offshore environment, and the rapid weathering expected for the MDO, with approximately 15-36.1% within 24 hours (Section 5.14.2.1), any impacts to benthic invertebrates from exposure to MDO are anticipated to be localised and short-term, with rapidly recovery expected. As such, a consequence ranking of '2' (Minor) was assigned.

Seabirds and shorebirds		
Exposure evaluation:		
Several threatened, migratory and/or listed marine species in the region have the potential to be rafting, resting, diving and feeding within the area predicted to be contacted by surface hydrocarbons; diving or foraging within in-water hydrocarbons; and foraging or nesting within shoreline exposure (Section 3.4.3.3). Four breeding BIAs for seabirds intersect the Hydrocarbon Area (MDO), including: • Fairy tern (EPBC Act listing as vulnerable) • Lesser crested tern (EPBC Act listing as migratory) • Roseate tern (EPBC Act listing as migratory) • Wedge-tailed shearwater (EPBC Act listing as migratory). Please refer to Section 3.4.3.3 for further details. Breeding grounds for the fairy tern are located on offshore islands in the Gascoyne and Pilbara with breeding occurring late July to September. Breeding for the lesser crested tern occurs around offshore islands in Gascoyne, Pilbara and Kimberley in March to June. Breeding grounds for the roseate tern occurs around offshore islands in Gascoyne, Pilbara and Kimberly during mid-March to July. Breeding for the wedge-tailed shearwater occurs in inshore islands around Montebello Islands between mid-August to April (Pilbara). The modelling predicted that the maximum distance for floating surface hydrocarbon exposure at the moderate threshold (10 g/m^2) from the source was predicted to be 18 km. The minimum time to shore at or above the low threshold as 110 hours (Montebello Island), with the minimum time to dissolved hydrocarbon exposure and entrained hydrocarbon exposure at any given receptor(s) was 51 hours and 23 hours, respectively, both at Montebello AMP.		
Predicted impact:		
Surface	**In-water**	**Shoreline**
Seabirds rafting, resting, diving or feeding within surface hydrocarbons may be exposed to surface hydrocarbons. Species most at risk include those that readily rest on the sea surface (such as shearwaters) and surface plunging species such as terns. Toxic effects on birds, including internal tissue irritation in their lungs and stomachs, may also result where the oil is ingested as the bird attempts to preen its feathers (ITOPF, 2011b).	Seabirds could be impacted by in-water hydrocarbon exposure directly (i.e. whilst diving through the water column foraging) or indirectly (i.e. by consuming hydrocarbon-tainted fish, resulting in sub-lethal or toxic impacts). As seabirds are top order predators, any impact on other marine life (e.g. pelagic fish) from hydrocarbon exposure may disrupt and limit food supply both for the maintenance of adults and the provisioning of young.	Shorebird species foraging for invertebrates in intertidal feeding habitats, such as exposed sand and mud flats at lower tides, will be at potential risk of both direct impacts through contamination of individual birds (ingestion or soiling of feathers) and indirect impacts through the contamination of foraging areas that may result in a reduction in available prey items (Clarke, 2010). Any direct impact of oil on terrestrial habitats has the potential to contaminate seabirds present at the breeding sites (Clarke, 2010).

In a review of 45 marine hydrocarbon spills, there was no correlation between the numbers of bird deaths and the volume of the spill (Burger, 1993).	Impacts are not anticipated at a population level due to the localised and temporary exposure of moderate levels of surface hydrocarbons.	Shoreline accumulation will be concentrated along the high tide mark while the lower/upper parts are often untouched (IPIECA, 1995). As breeding activities of shorebirds and seabirds generally occurs above the high tide mark, exposure to hydrocarbons is considered unlikely to occur. However, the weathering expected for the light non-persistent hydrocarbon, and the tidal action and constant wave washing on this type of shoreline which would contribute to further weathering of any hydrocarbons in the intertidal shoreline area.
Predicted impact summary:		
Acute or chronic toxicity impacts to seabirds is possible, however, the presence of birds within areas exposed to moderate threshold levels is expected to be limited, due to the transitory nature of foraging individuals, and given the absence of offshore aggregation areas in the area. Breeding BIAs for several bird species intersect the Hydrocarbon Area (MDO) at several offshore Pilbara islands within the Hydrocarbon Area (MDO), including the Montebello Islands which is a known nesting site for wedge-tailed shearwaters. However, shoreline accumulation is unlikely to impact breeding areas given that shoreline accumulation will be concentrated along the high tide mark, and breeding activities tend to occur above the high tide mark. Furthermore, exposure of any rafting or foraging seabirds to MDO is also expected to be limited due to the predicted rapid weathering and entrainment of MDO (Section 5.14.2.1), limiting the area of surface exposure, for seabirds to come into contact with. There is the potential for indirect impacts to seabirds in offshore waters as a result of hydrocarbon exposure, such as reduced prey abundance. Consequently, the potential impacts and risks to seabirds from a release of MDO following vessel collision event are expected to result in localised, short-term impacts to species of recognised conservation value, however not affecting population or ecosystem functioning. As such, a consequence ranking of '2' (Minor) was assigned.		
Fish, sharks and rays		
Exposure evaluation:		
Various fish and shark species were identified by the EPBC Protected Matters Search for the wider EMBA (MDO) area. A foraging BIA for the whale shark was identified within the Operational Area (Section 3.4.4). Any pelagic fish and shark species that occupy the water column, specifically within the upper 0–10 m of the water column the surface layers of the water column (where in-water hydrocarbon exposure is predicted), are more susceptible to entrained and dissolved hydrocarbons. Since fish, sharks, and rays do not generally break the sea surface, the impacts of surface hydrocarbons to fish and shark species are unlikely to occur. Near the sea surface, fish are able to detect and avoid contact with surface slicks meaning fish mortalities rarely occur in the event of a hydrocarbon spill in open waters (Volkman et al., 1994). There may be demersal species may be susceptible to oiled sediments, particularly species that are site restricted.		

The maximum distance for dissolved hydrocarbons at moderate exposure (50 ppb) from the source was predicted to be 58 km. The maximum distance for entrained hydrocarbons at this exposure from the source was predicted to be 237 km.

Predicted impact:

In-water

Fish, sharks, and rays can be exposed to in-water hydrocarbon droplets through a variety of pathways, including:

- Direct dermal contact (e.g. whilst swimming through oil or waters with elevated dissolved hydrocarbon concentrations and other constituents, with diffusion across their gills (Hook et al., 2016))
- Ingestion (e.g. directly or via food base, fish that have recently ingested contaminated prey may themselves be a source of contamination for their predators)
- Inhalation (e.g. elevated dissolved contaminant concentrations in water passing over the gills).

Exposure to hydrocarbons entrained or dissolved in the water column can be toxic to fish. Studies have shown a range of sub-lethal impacts in adult fish, such as altered heart and respiratory rates, gill hyperplasia, enlarged liver, reduced growth, fin erosion, impaired endocrine systems, behavioural modifications and alterations in feeding, migration, reproduction, swimming, schooling, and burrowing behaviour (Kennish, 1998).

A Foraging BIA for the whale shark intersects the Operational Area (Section 3.4.4). Whale sharks are suction filter feeders and are known to congregate in Ningaloo during March to July to feed on the seasonal concentrations of krill and other zooplankton which occur during coral spawning events. Hydrocarbon spills may pose a threat to whale sharks (DoE, 2024a).

However, generally these species are highly mobile species, and their patterns of movements makes it unlikely for them to remain within the area long enough to be exposed to hydrocarbons to experience sub-lethal impacts (ITOPF, 2011b). Pelagic species fish are able to detect and avoid contact with surface slicks meaning fish mortalities rarely occur in the event of a hydrocarbon spill in open waters (Volkman et al., 1994). As a result, wide-ranging pelagic fish of the open ocean generally are not highly susceptible to impacts from surface hydrocarbons.

Fish are most vulnerable to hydrocarbons during their embryonic, larval and juvenile life stages (Fodrie and Heck, 2011; Hjermann et al., 2007).

Recovery of fish assemblages depends on the intensity and duration of an unplanned discharge, the composition of the discharge and whether dispersants are used, as each of these factors influences the level of exposure to potential toxicants. Recovery would also depend on the life cycle attributes of fishes. Species that are abundant, short-lived and highly fecund may recover rapidly. However less abundant, long-lived species may take longer to recover. The range of movement of fishes will also influence recovery. The nature of the receiving environment would influence the level of impact on fishes.

Predicted impact summary:

A number of fish and shark species, including the whale shark may occur in the Hydrocarbon Area (MDO). Given the wide distribution of fish species in the region, the wide-spread foraging area typical of whale sharks, and the nature of potential impacts, impacts to an entire population or population's overall viability is not anticipated. Fish and shark populations are widespread throughout the Hydrocarbon Area (MDO), therefore, an accidental release of MDO is not expected to affect population functioning.

Due to the highly dispersive environment of the offshore environment, and the rapid weathering expected for the MDO, 15–36.1% within 24 hours depending on the conditions (Section 5.14.2.1) any impacts to fish and shark populations from exposure to MDO are anticipated to be localised and short-term, and not expected to affect species populations or general ecosystem functioning. As such, a consequence ranking of '2' (Minor) was assigned.

Marine mammals

Exposure evaluation:

Several marine mammal species were identified by the EPBC Protected Matters Search for the Hydrocarbon Area (MDO), including:

- Sei whale (EPBC Act listing as vulnerable)
- Blue whale (EPBC Act Listing as endangered)
- Fin whale (EPBC Act listing as vulnerable)
- Southern right whale (EPBC Act listing as endangered).

A Migration BIA for the humpback whale intersects the Hydrocarbon Area (MDO). The humpback whale migration corridor extends along the WA coast out to ~50–100 km from the coast. Migration occurs between May and late November.

The maximum distance for dissolved hydrocarbons at moderate exposure (50 ppb) and entrained hydrocarbons at the high exposure (100 ppb) was predicted to be 58 km and 237 km (Section 5.14.2.1).

Predicted impact:

Surface	**In-water**
Marine mammals may come into contact with surface hydrocarbons when surfacing. However, direct surface oil contact with hydrocarbons is considered to have little deleterious effect on marine mammals, and any effect is likely to be minor and temporary. The inhalation of oil droplets, vapours and fumes is a distinct possibility if cetaceans' surface in slicks to breathe, particularly with non-persistent hydrocarbons prone to evaporation, such as MDO. Exposure to hydrocarbons in this way could damage mucous membranes, damage airways, or even cause death. Given the mobility of whales, only a small proportion of a population is anticipated to surface in the affected areas, resulting in short-term and localised consequences, with no long-term population viability effects. Habitat modification is identified as threats for the blue whale, southern right whale, and dugong. Activities within this EP will not be inconsistent	Chronic toxicity effects have the potential to occur in the event of prolonged and continuous exposure (e.g. >96 hours) to high concentrations of hydrocarbons in the water column (NRC, 2001). The susceptibility to ingested hydrocarbon has also been shown to vary with feeding habits. However, previous reports of health declines from ingestion has mainly been identified following spills of heavier hydrocarbons, and less so with light, non-persistent hydrocarbons such as MDO. Geraci (1988) found little evidence of cetacean mortality from hydrocarbon spills; however, some behaviour disturbance (including avoidance of the area) may occur. Pelagic species have been said to avoid hydrocarbon, mainly because of its noxious odours, but this has not been proven. In the event that avoidance were to occur, the potential for physiological impacts from contact with hydrocarbons would be reduced, however, active avoidance of an area may disrupt behaviours such as migration, or displace individuals from important habitat, such as foraging, resting or breeding.

with the conservation and management priorities outlined in these Conservation Management Plans.	Although, the strong attraction to specific areas for breeding or feeding (e.g. the breeding, calving and nursing grounds within the North-West Cape region for the dugong) may override any tendency for marine mammals to avoid the noxious presence of hydrocarbons.

Predicted impact summary:

As highly mobile species, in general it is very unlikely that cetaceans will be constantly exposed to concentrations of hydrocarbons in the water column for continuous durations (e.g. >96 hours) that would lead to chronic toxicity effects (NRC, 2001).

The modelling predicted that the hydrocarbons would weather rapidly if released to the environment (Section 5.14.2.1). Relatively fresh hydrocarbons (closer to the release location) are considered to have the greatest potential for impact. Therefore, the potential for environmental impacts would be limited to a relatively short period following the release and would need to coincide with a migration or aggregation event to result in exposure to a large number of individuals. Regardless, such exposure is not anticipated to result in long-term population viability effects. A proportion of the migrating population of whales could be affected for a single migration event, which could result in temporary and localised consequences. Given the wide distribution of marine mammal species in the region and the nature of the potential impacts, impact to an entire population or the population's overall viability is not anticipated. Any impacts to marine mammals from exposure to MDO are anticipated to be localised and short-term. As such, a consequence ranking of '2' (Minor) was assigned.

Marine reptiles

Exposure evaluation:

Marine reptiles may be exposed to hydrocarbon when transiting through the in-water hydrocarbons, surfacing to breathe within the surface slick, or nesting on oiled shorelines.

BIAs and habitat critical for the survival of marine turtles for 4 species of marine turtles intersect the Hydrocarbon Area (MDO), including:

- Flatback turtle (EPBC Act listed as vulnerable)
- Green turtle (EPBC Act listed as vulnerable)
- Hawksbill turtle (EPBC Act listed as vulnerable)
- Loggerhead turtles (EPBC Act listed as endangered).

Turtle nesting and internesting areas and rookeries for sea turtles in the Hydrocarbon Area (MDO) including the Montebello islands.

The Recovery Plan for Marine Turtles in Australia: 2017–2027 (CoA, 2017) highlights acute chemical discharge as one of several threats to marine turtles.

EPBC Act listed sea snakes that are found within the Hydrocarbon Area (MDO) include:

- Short-nosed sea snake (EPBC Act listed as critically endangered)
- Leaf-scaled sea snake (EPBC Act listed as critically endangered)
- Dubois' sea snake (EPBC Act listed as marine).

There may be sea snakes present in the area predicted to be exposed to surface hydrocarbon within the Hydrocarbon Area (MDO); however, their presence is expected to be of a transitory nature only, and most species are not pelagic and therefore unlikely to be in high numbers within the Hydrocarbon Area (MDO).

Probability of shoreline contact for Montebello Islands reaching the moderate threshold is low and only expected during the transitional season (1%) and winter (6%). The maximum distance from the release location to floating oil exposure in moderate thresholds will be 18 km south during winter (Section 5.14.2.1).

Predicted impact:

Surface	**In-water**	**Shoreline**
Marine turtles Marine turtles make large, rapid inhalations before they dive which may result in inhalation of toxic vapours from hydrocarbons in surface waters (Milton and Lutz, 2003). This can lead to respiratory irritation, inflammation, emphysema or pneumonia (NOAA, 2010b). This is expected in particular for light non-persistent hydrocarbons which undertake high levels of evaporation, such as MDO, compared to heavier hydrocarbons. Sea snakes Foraging behaviours which occur near the water surface may increase the vulnerability of individuals to hydrocarbon exposure (Yaghmour et al., 2022).	Some individual marine reptiles may come into contact with in-water hydrocarbon exposure while swimming or feeding. Marine turtles Records of oiled wildlife during spills rarely include marine turtles, even from areas where they are known to be relatively abundant (Short, 2011). This is particularly the case for spills of light non-persistent hydrocarbons, such as MDO. Sea snakes Sea snakes have the potential to be directly and indirectly impacted by hydrocarbons. In general, there is limited literature on the impacts of oil spills to sea snakes, particularly for spills of light non-persistent hydrocarbons, such as MDO. Light oils, which are less likely to cause severe external oiling, however, they may expose marine fauna to volatile PAHs during at the surface during inhalations.	Marine turtles may experience oiling impacts on nesting beaches when they come ashore to lay their eggs. Studies on freshwater snapping turtles showed uptake of PAHs from contaminated nest sediments, but no impacts on hatching success or juvenile health following exposure of eggs to dispersed weathered light crude (Rowe et al., 2009). However, other studies found evidence that exposure of freshwater turtle embryos to PAHs results in deformities (Bell et al., 2006; Van Meter et al., 2006). Marine pollution is listed as a threat to marine turtle in the Recovery Plan for Marine Turtles in Australia, 2017 – 2027, particularly in relation to shoreline oiling of nesting beaches.

Predicted impact summary:

The number of marine turtles that may be exposed to hydrocarbons during a spill event is expected to be low due to the localised and temporary presence of surface hydrocarbons due to the rapid weathering anticipated (Section 5.14.2.1).

Shoreline accumulation at nesting beaches within the Hydrocarbon Area (MDO) was predicted as a very low probability (Section 5.14.2.1). The activity will be conducted in a manner which is not inconsistent with the relevant management actions. Therefore, the potential impact would likely be limited to individual transiting marine turtles, with population impacts not anticipated.

The number of sea snakes that may be exposed is expected to be low due to the offshore location, the low number of sea snakes anticipated within the Hydrocarbon Area (MDO), the lack of BIAs, the extent of exposure above the threshold, and the anticipated rapid weathering of the light-non persistent hydrocarbon. Therefore, impacts to sea snakes at both an individual or population level is not anticipated.

Due to the highly dispersive environment of the offshore environment, and the rapid weathering expected for the MDO, with approximately 15–36.1% evaporated within 24 hours depending on the conditions (Section 5.14.2.1).

Therefore, any impacts to marine reptiles from exposure to MDO are anticipated to be localised and short-term, with no impacts to population or ecosystem functioning. As such, a consequence ranking of '2' (Minor) was assigned.

Protected and Significant Areas

Protected and significant areas which have only ecological values have been assessed based on the hydrocarbon exposure based on the thresholds that have the potential to cause ecological impacts (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using moderate hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved) and the high hydrocarbon exposure for in-water (entrained) hydrocarbons. This is defined as the Hydrocarbon Area (MDO).

Protected and significant areas which also include socio-economic value have been assessed based on the most conservative hydrocarbon exposure thresholds, such as those that have the potential to cause socio-economic effects (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using low hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved and entrained) hydrocarbons. This is defined as the EMBA (MDO).

Table 5-60 evaluates the potential impact that hydrocarbon spills for this activity may have on protected and significant areas receptors found within the Hydrocarbon Area (MDO) or EMBA (MDO).

Table 5-60: Risk assessment for an accidental release of MDO – protected and significant areas

Marine parks
Exposure evaluation:
There are ten Australian Marine Parks (AMPs) intersecting the EMBA (MDO) (Section 3.6.4): • Abrolhos AMP • Argo-Rowley Terrace AMP • Carnarvon Canyon AMP • Dampier AMP • Eighty Mile Beach AMP • Gascoyne AMP • Mermaid Reef AMP • Montebello AMP • Ningaloo AMP • Shark Bay AMP. Five State Marine Protected Areas (MPAs) intersect the EMBA (MDO) (Section 3.6.5): • Eighty Mile Beach Marine Park • Montebello Islands and Barrow Islands (Jointly Managed) • Ningaloo and Murion Islands Marine Management area (Jointly Managed) • Pilbara Islands Nature Reserve • Rowley Shoals Marine Park. The major conservation values for the above AMPs and State MPAs have been identified in Section 3.6.4 and Section 3.6.5, respectively. These sites and their associated values may be impacted by exposure to surface, in-water, and shoreline hydrocarbons. The AMPs and State MPAs include examples of unique ecosystems with characteristics that support diverse benthic or intertidal habitats, and often a range of species listed under the EPBC Act, often including BIAs, such as breeding and foraging habitat for seabirds, internesting, foraging, mating, and nesting habitat for marine turtles, breeding, calving, foraging and nursing habitat for dugongs, foraging habitats, and migratory pathway for certain marine species, such as humpback whales, pygmy blue whales, whale sharks.

Mangrove thickens are found on some of the Montebello Islands and Pilbara Islands which provide essential habitat for coastal species and shorebirds (Section 3.4.2.1).

Sea Country which overlaps these AMPs and MPAs is valued for Indigenous cultural identity, health and wellbeing.

Several AMPs contain known shipwrecks listed under the *Historic Shipwrecks Act 1976*.

Tourism, commercial fishing, mining, port activities, and recreation are important activities in some of the AMPs and MPAs (DNP, 2018a; 2018b).

No AMPs or State MPAs were exposed to surface hydrocarbons, at, or above, the low threshold for any season (RPS, 2024).

The minimum time to dissolved hydrocarbon exposure at the low 10 ppb threshold at any given receptor(s) was 27 hours at the Montebello AMP, which also recorded the highest probability of intersect with at 7%. The highest probability of entrained hydrocarbons at the low 10 ppb threshold was predicted at Montebello AMP at 54% with contact predicted in 22 hours (RPS, 2024). The in-water probability results for the other AMPs to be intersected by these threshold levels included:

- 13% entrained and 1% for dissolved at Gascoyne AMP.
- 1% entrained and 1% dissolved at Dampier AMP.

The MDO spill modelling identified that the highest probability of hydrocarbon accumulation on a specific shoreline at or above the low threshold (10 g/m^2) was 15% at the Barrow Island and Montebello Islands shoreline cell during winter, which is a considered part of the Pilbara Islands Nature Reserve MPA. The shoreline cells for Barrow Island and Montebello Islands recorded the minimum time to shore at 3.8 days (91 hours) and the maximum total volume of hydrocarbon ashore for a single spill trajectory was 23.2 m^3. Barrow Island and Montebello Islands recorded the maximum length of hydrocarbon ashore above the low threshold (14 km) (Section 5.14.2.1).

Predicted impact:

In-water	Shoreline
The values identified within these Protected Areas (AMPs and MPAs) have the potential to be exposed to entrained and dissolved hydrocarbons at, or above, the relevant threshold in the event of a MDO spill incident. Marine fauna, such as seabirds, fish and whales, found within the water column are values of the AMPs and State MPAs that may be impacted when exposed to entrained or dissolved hydrocarbons. Exposure of in-water hydrocarbons will be greatest within the upper 10 m of the water column and areas close to the spill source, as such, values on the seafloor (i.e., benthic habitats, shipwrecks and cultural artefacts) are unlikely to be impacted.	Hydrocarbons can become concentrated as it strands ashore. However, most of the oil is concentrated along the high tide mark while the lower/upper parts are often untouched (IPIECA, 1995). Coastal habitats, such as mangroves, and communities which utilise these habitats, such as shorelines and marine turtles, are important and sensitive values of the MPAs. These values can be directly impacted, or have important activities disrupted, if exposed to shoreline hydrocarbons at the relevant thresholds. Visual surface hydrocarbons, or exclusion zones, have the potential to impact and / or displace certain values, such as tourism, recreational activities, and heritage values. Impact to these receptors from direct or indirect exposure to shoreline hydrocarbons may cause a subsequent negative impact to the value of the State MPAs.

In-water exposure at relevant thresholds may impact culturally important significant values, such as Sea Country, and result in adverse impacts to activities such as fishing.
Impact to these receptors from direct or indirect exposure to in-water hydrocarbons may cause a subsequent negative impact to the value of the Protected Areas.
The MDO spill scenario is expected to be localised and short term, with the majority of the MDO rapidly weathering within the first few days. Therefore, the Protected Areas are expected to recover relatively quickly.
The predicted impact to the individual values of the Protected Areas have been assessed separately.
Refer to:
• Benthic habitats
• Coastal communities
• Marine fauna:
  ○ Plankton
  ○ Benthic invertebrates
  ○ Seabirds and shorebirds
  ○ Fish, sharks and rays
  ○ Marine mammals
  ○ Marine reptiles
• Social and Economic Environment:
  ○ Commercial fisheries
  ○ Tourism and recreational fishing
  ○ Other marine users (underwater heritage)
  ○ First Nations.
	The MDO spill scenario is expected to be localised and short term, with the majority of the MDO rapidly weathering within the first few days. Therefore, the Protected Areas are expected to recover relatively quickly.
	The predicted impact to the individual values of the Protected Areas have been assessed separately. Refer to:
	• Coastal communities
	• Marine fauna:
	  ○ Seabirds and shorebirds
	  ○ Marine reptiles.
	• Social and Economic Environment:
	  ○ Tourism and recreational activities
	  ○ First Nations.

Predicted impact summary:	
Given the highly dispersive environment of the offshore environment, the weathering expected for the light non-persistent hydrocarbon (Section 5.11.2.1), and the tidal action and constant wave washing on this type of shoreline which would contribute to further weathering of any hydrocarbons in the intertidal shoreline area,	

the potential consequences to AMPs and State MPAs from exposure to hydrocarbons following a vessel collision has the potential for localised and short-term impacts on habitats and species of recognised conservation value or to local ecosystem functioning. As such, a consequence ranking of '2' (Minor) was assigned.
Key Ecological Features
Exposure evaluation:
The Hydrocarbon Area (MDO) intersects 4 KEFs. These include: • Ancient coastline at 125 m depth contour • Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula • Continental slope demersal fish communities • Glomar Shoals. The conservation values for these KEFs have been described in Section 3.6.7 and include unique seafloor environments that are considered to be of regional importance for a region's biodiversity or ecosystem function and integrity. The highest probability of entrained hydrocarbons at the high 100 ppb threshold for Glomar Shoals KEF (3% during winter) with contact predicted in 75 hours (RPS, 2024). The entrained in-water probability results for other KEFs to be intersected at the high threshold levels included: • 1% at Ancient coastline at 125 m depth contour KEF. Dissolved hydrocarbon exposure at the moderate 50 ppb threshold was not predicted at any KEF. No contact was predicted for Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula KEF and Continental slope demersal fish communities KEF at the high threshold level (RPS, 2024).
Predicted impact:
In-water
No KEFs were predicted to be exposed to surface hydrocarbons at any threshold for any season (RPS, 2024). The values identified within these KEFs have the potential to be exposed to entrained hydrocarbons at, or above, the high threshold. However, the exposure of entrained hydrocarbons will be greatest within the upper 10 m of the water column and areas close to the spill source. Therefore, the spill is unlikely to intersect with majority of the seafloor values of the KEFs which are concentrated within the water column >10 m deep or along the seafloor at varying water depths. Hydrocarbon exposure to the key receptors of the KEFs (e.g. seabirds, pinnipeds and cetaceans) may cause a subsequent negative impact to the value of the KEFs, however is expected to be limited to a small number of individuals, with no impacts to regional populations.

Refer to:

- Benthic habitats
- Marine fauna
    - Plankton
    - Fish, sharks and rays
    - Seabirds and shorebirds
    - Marine mammals
    - Marine reptiles.

Predicted impact summary:

Given the highly dispersive environment of the offshore environment, the weathering expected for the light non-persistent hydrocarbon (Section 5.15.2.1), and the tidal action and constant wave washing on this type of shoreline which would contribute to further weathering of any hydrocarbons in the intertidal shoreline area, the potential consequences to KEFs from exposure to hydrocarbons following a vessel collision has the potential for localised and short-term impacts on habitats and species of recognised conservation value or to local ecosystem functioning. As such, a consequence ranking of '2' (Minor) was assigned.

Other Marine Users

Other marine users have been assessed based on the hydrocarbon exposure based on the thresholds that have the potential to cause socio-economic effects (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using low hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved and entrained) hydrocarbons. This is defined as the EMBA (MDO).

Table 5-61 evaluates the potential impact that hydrocarbon spills for this activity may have on other marine users found within the EMBA (MDO).

Table 5-61: Risk assessment for an accidental release of MDO – other marine users

Commercial fisheries
Exposure evaluation:
Several State-managed fisheries were identified to have management areas that intersect the EMBA (MDO). The maximum distance for dissolved and entrained hydrocarbons at a low threshold (100 ppb) from the source was predicted to be 169 km and 494 km, respectively (RPS, 2024). The fisheries that have the potential to interact with the EMBA include 5 Commonwealth Fisheries. However, of these fisheries only 1 fishery has recorded active fishing based on historical datasets and have the potential to interact with the EMBA: North West Slope Trawl Fishery. 19 WA State Fisheries intersect the EMBA (MDO). However, of these fisheries, only 16 fisheries have recorded active fishing in the EMBA (MDO) between 2018 – 2023 and have potential to interact with the EMBA (MDO), including: • Exmouth Gulf Prawn Managed Fishery • Hermit Crab Fishery • Mackerel Managed Fishery • Marine Aquarium Fish Managed Fishery • Nickol Bay Prawn Fishery • Onslow Prawn Limited Entry Fishery • Open Access (North Coast, Gascoyne Coast and West Coast Bioregions) • Pearl Oyster Managed Fishery • Pilbara Crab Managed Fishery • Pilbara Fish Trawl Interim Managed Fishery • Pilbara Line Fishery (Condition) • Pilbara Trap Managed Fishery • Specimen Shell Managed Fishery • Tour Operator • West Coast Deep Sea Crustacean Managed Fishery • Western Australian Sea Cucumber Fishery. Refer to Section 3.5.1 for a further description on fisheries that intersect the wider EMBA.

Predicted impact:	
Surface	**In-water**
Physical displacement of commercial fishers may occur due to the establishment of exclusion zones during the spill response. Visible surface hydrocarbons (i.e. a rainbow sheen) may have the potential to cause impact public perception of the industry, potentially causing a negative economic impact. Refer to: • Fish, sharks, and rays.	As discussed in the relevant sections above (i.e. fish and invertebrates) exposure to in-water hydrocarbons has the potential to impacts species. Due to the sensitivity, a small number of juvenile fish, larvae, and planktonic organisms, may be impacted. Studies on the impact of light, non-persistent hydrocarbon spills, such as the Montara spill in Australia, have provided support that the highest potential impacts are on eggs and larvae of fish species (Young et al., 2011). As a result this could lead to some component, or all of a year class, given that most species have seasonal pulsed recruitment, of commercially targeted marine species (i.e. fish and invertebrate species) to be impacted. This has been identified to pose a significant risk for short-lived species (e.g. Goldband snapper) and less for long-lived species (Young et al., 2011). In-water hydrocarbon exposure may result in a reduction of individual commercially targeted marine species, subsequently resulting in potential impacts to commercial fishing productivity. Contamination of target species can cause economic impacts to the industry. Additionally, as discussed in the section above on plankton, the toxicity impacts on plankton could adversely affect fisheries by eliminating planktonic prey for first feeding early embryos (Young et al., 2011). Refer to: • Fish, sharks, and rays • Invertebrates.
Predicted impact summary:	
Acute impacts to commercially fished species may occur, however are expected to be limited to a small number of juvenile fish, larvae, and/or planktonic organisms. Depending on the timing of the spill, in the event that it overlaps with the timing of a species reproduction event (i.e. a spawning event), there is potential for localised impacts to population recruitment for commercially targeted species. However, due to the wide distribution of fish species typical in the region, the typical timing of recruitment events, and the nature of potential impacts from a spill of MDO, impacts to an entire population, or population's overall viability is not anticipated. Due to the highly dispersive environment of the offshore environment, and the rapid weathering expected for the MDO, as a light, non-persistent hydrocarbon, 15 – 36.1% evaporated within 24 hours depending on the conditions (Section 5.14.2.1), and high anticipated entrainment rates, any exclusion zones are not expected to be	

long-term and not cause significant impacts to the economic viability of the fishery. Impacts are expected to be limited to localised and short-term exclusion from the area affected. As such, a consequence ranking of '2' (Minor) was assigned.		
Tourism and recreational fishing		
Exposure evaluation:		
The Ningaloo region is a major tourism area that is overlapped by the EMBA (MDO). The Ningaloo region includes Ningaloo AMP, Ningaloo World Heritage Area, Ningaloo and Muiron Islands State MP, and Coral Bay and Exmouth communities. These areas are popular for a diverse range of marine-based tourism and recreational activities, such as: whale watching, recreational boating and fishing, charter fishing, snorkelling/diving, and surfing.		
Predicted impact:		
Surface	**In-Water**	**Shoreline**
Visible surface hydrocarbons (i.e. a rainbow sheen) have the potential to reduce the visual amenity of the area for tourism and discourage recreational activities. Recreation is also linked to the presence of marine fauna and direct impacts to marine fauna such as whales, dolphins, birds can result in indirect impacts to recreational values. It is important to note that the impact from a public perception perspective may be even more conservative. This may deter tourists and locals from undertaking recreational activities. If this occurs, the attraction is temporarily closed, economic losses to the business are likely to eventuate. The extent of these losses would be dependent on how long the attraction remains closed. Refer also to: • Fish, sharks and rays • Seabirds and shorebirds • Marine mammals • Benthic invertebrates.	Any impact to receptors that are associated with marine-based tourism (e.g. whales, and whale sharks) may cause a subsequent negative impact to recreation and tourism businesses in the locally affected area. Recreational fishing over the area is popular. Precautionary exclusion from impacted areas following a hydrocarbon spill may be implemented until water quality monitoring verifies the absence of residual hydrocarbons. This could result in a temporary disruption to some recreational and tourism activities within and area for the duration of the response (if applicable).	Visible hydrocarbons stranded on shorelines have the potential to reduce the visual amenity of the area for tourism and discourage recreational activities. Precautionary exclusion from shorelines may be implemented by local governments until water quality monitoring verifies the absence of residual hydrocarbons. This could cause disruption to some recreational and tourism activities within that area. Furthermore, visible hydrocarbons along shorelines may impact the aesthetic value for tourism and discourage recreational activities that may be operating within the area.

Predicted impact summary:	
Given the nature of the hydrocarbon, being a light and non-persistent, the low probability of shoreline impacts, and high anticipated evaporation and entrainment rates (Section 5.14.2.1), any impacts to recreation and tourism are expected to be localised and short-term. As such, a consequence ranking of '2' (Minor) was assigned.	
Additional other marine users	
Exposure evaluation:	
Surface hydrocarbons may interact with other marine users, such as • Commercial shipping • Other oil and gas industry • Defence activities • Underwater heritage. The closest AMSA shipping fairway is 3 km south of the Operational Area, which indicates high shipping use within the area and the potential to interact with the EMBA (MDO) (Section 3.5.2). Several other offshore oil and gas industries and pipelines are located within the EMBA (MDO). The EMBA (MDO) encompasses defence activities including an Exmouth naval communication station and several offshore training areas including the North West Exercise Area (NWXA) and Learmonth Air Weapons Range in the EMBA (MDO). These areas are used for Defence Force training exercises, including live firing (Section 3.5.3). There are 38 known historical shipwrecks located within the EMBA (MDO).	
Predicted impact:	
Surface	**In-water**
Physical displacement of other marine users may occur due to the establishment of exclusion zones during the spill response. However, due to the comparatively small area of exposure, and the fact that exclusion zones are not expected to be long-term, significant impacts are not anticipated.	In the event of a hydrocarbon spill, other marine users may be impacted by exclusion zones surrounding a spill. These users include: • Commercial shipping • Other oil and gas industry • Defence activities. Exclusion zones could reduce access for other marine users for the duration of the response undertaken for spill clean-up (if applicable) meaning vessels may have to take detours leading to potential delays and increased costs.

	Underwater Heritage In general, in-water exposure is limited to the upper 0 – 10 m of the water column, and not within the deeper areas of the water column where underwater heritage is located. Therefore, impacts are not expected.
Predicted impact summary:	
Given the nature of the hydrocarbon, being a light and non-persistent, the low probability of shoreline impacts, and high anticipated evaporation and entrainment rates (Section 5.14.2.1), any impacts to other marine users are expected to be localised and short-term. As such, a consequence ranking of '2' (Minor) was assigned.	

First Nations

First Nations values and sensitivities have been assessed based on the hydrocarbon exposure based on the most conservative thresholds that have the potential to cause socio-economic effects (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using low hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved and entrained) hydrocarbons. This is defined as the EMBA (MDO).

Table 5-62 evaluates the potential impact that hydrocarbon spills for this activity may have on First Nations values and sensitivities found within the EMBA (MDO).

Table 5-62: Risk assessment for an accidental release of MDO – First Nations

First Nations heritage
Exposure evaluation:
The EMBA (MDO) overlaps the following RATSIB Areas: • Kimberley: Kimberley Land Council Aboriginal Corporation • Pilbara: Yamatji Marlpa Aboriginal Corporation • Gascoyne-Midwest: Yamatji Marlpa Aboriginal Corporation. The EMBA (MDO) overlaps 3 Native Title Determinations: • Ngarluma/Yindjibarndi • Yaburara & Mardudhunera People • Gnulli, Gnulli #2 and Gnulli #3 - Yinggarda, Baiyungu and Thalanyji People. No IPAs are located in the EMBA (MDO), Hydrocarbon Area (MDO) or Operational Area. First Nations people are intrinsically linked to Sea Country which encompasses lands, waterways, seas, cultural practices and values to which they are connected (AIATSIS 2022). Country is a cultural landscape which includes both tangible values (i.e. cultural heritage sites) and intangible values (i.e. creation stories and cultural practices). First Nations cultural concepts are directly connected with Country. Country describes all aspects of place, environment, spirituality, law and identity. Values of Country differ between First Nations groups, and not all First Nations groups and communities in Australia hold the same belief systems or spirituality. Sea Country is Country that extends into the ocean. Smyth and Isherwood (2016) describe Sea Country as all estuaries, beaches, bays, and marine areas collectively, within a traditional estate. Sea Country contains evidence of the ancient mystical events by which all geographic features, animals, plants and people were created. Sea Country contains sacred sites and tracks (or 'Songlines') along which mythological beings travelled during the creation period (or 'Dreamtime') (Smyth and Isherwood, 2016). The sea, like the land, is integral to the identity of First Nations groups. Connection to Sea Country is accompanied by a complexity of cultural rights and responsibilities. Coastal areas traditionally were amongst the most densely populated areas due to the abundance of resources available. Formal recognition of Sea Country rights is significantly slower compared to land rights. This could be for a range of reasons including conflicting perspectives and opinions on traditional custodianship of land and how far it extends (Smyth and Isherwood, 2016). An unplanned hydrocarbon spill will impact the waters within Sea Country for a period while the spill disperses and weathers and has the potential to disrupt cultural values of Sea Country. The likelihood of a hydrocarbon spill occurring is assessed as highly unlikely and the actual area that may be affected from any single spill event would be considerably smaller than represented by the EMBA (MDO). The sea component of these areas may be contacted from surface, in-water, and shoreline hydrocarbon exposure. Hydrocarbon exposure may have the potential to impact the aesthetic and cultural values of Sea Country by the presence of physical hydrocarbons or the presence of oil spill responders.

First Nations heritage		
Predicted impact:		
Surface	**In-water**	**Shoreline**
Visible surface hydrocarbons have the potential to reduce the visual amenity of known culturally significant values identified within the marine environment, subsequently potentially impacting the value of the site to First Nations people. A number of Aboriginal Corporations identified values, features and interests of cultural value during consultation (Table 3-16). Totemic species were identified, as well as shorelines and islands of significance. Refer also to: • Seabirds and shorebirds • Marine reptiles • Marine mammals.	First Nations people connection to Sea Country could potentially be impacted by exposure to hydrocarbons. See Section 3.7.6 for further details of the values. In-water exposure at relevant thresholds may impact culturally important significant coastal habitats such as mangroves, and species to First Nations peoples, such as cetaceans, marine reptiles, and fish which may impact the cultural value of the species and cultural obligation to care for Country. The 10 ppb low entrained exposure threshold (used to define the extent of the EMBA (MDO)) represents the very lowest concentration and corresponds generally with the lowest trigger levels for chronic exposure for entrained hydrocarbons in water quality guidelines, no ecological impacts are anticipated at this threshold. It is considered highly unlikely that there will be long-term impacts to First Nations activities from contact at the low entrained threshold. Furthermore, the spill scenario is expected to be localised and short-term, with the MDO rapidly weathering within the first few days. As evaluated above, impacts and risks to First Nations values are not expected to result in widespread long-term impacts to Sea Country, ecosystem functions and integrity, or culturally significant species populations. Refer also to: • Benthic habitats and communities • Marine invertebrates	Visible hydrocarbons along a shoreline have the potential to reduce the visual amenity of known heritage sites along the coastline, subsequently potentially impacting the value of the site to First Nations people. A number of Aboriginal Corporations identified shorelines and islands of cultural value during consultation (Table 3-16), including Kariyarra Island, Whim Creek, Maitland River and Delambre Island. Refer also to: • Coastal habitats • State Marine Parks.

First Nations heritage		
	• Mangroves • Cetaceans • Marine reptiles • Seabirds and shorebirds • State Marine Parks • Commonwealth Marine Parks.	
Predicted impact summary:		
First Nations people's connection to Sea Country could potentially be impacted by exposure to hydrocarbons. However due to the characteristics of the spill scenario, and the open water conditions of the Operational Area, the MDO is anticipated to rapidly disperse through the mixing of surface waters and near surface waters, driven by tidal current and wave action. Aboriginal Corporations identified a number of values, features and interests of cultural value during consultation (Table 3-16). These areas sit outside the Operational Area, however some of these are located within the EMBA and may be exposed to hydrocarbons in the event of a spill. Consequently, the potential impacts and risks to cultural heritage receptors from an accidental of MDO are expected to result in localised medium-term impacts to socio-economic activities. As such, a consequence ranking of '3' (Moderate) was assigned.		

5.14.4 Risk Ranking

Vessel movements will occur within the Operational Area, introducing the potential for vessel collisions resulting in an accidental release of MDO. However, given the hydrocarbon characteristics of MDO as a light non-persistent hydrocarbon, the anticipated rapid weathering of the MDO, and minimal shoreline accumulation, any impact is anticipated to be predominantly highly localised, with short-medium term impacts to individuals, not affecting species populations or general ecosystem functioning. Therefore:

- The consequence ranking of '3' (Moderate) was assigned to a change in water quality, coastal communities, and First Nations values, and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).
- The consequence ranking of '2' (Minor) was assigned to benthic habitats, marine fauna, protected and significant area, and social and economic environment, and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).

5.14.5 ALARP Demonstration

Table 5-63: Demonstration of ALARP – Accidental release of MDO

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-
Prevention			
Notification of activities direct to relevant persons.	EPO-ED-10	Relevant persons to be identified and notified as appropriate prior to activity, in accordance with Table 9-6.	Record of relevant person assessment and correspondence.
Navigational lights on vessels and MODU.		Vessel and MODU navigation lighting shall comply with SOLAS and the *Navigation Act 2012*.	VOGA inspection or audit confirms lighting complies with SOLAS and the *Navigation Act 2012*.
Vessels shall be DP capable.		Vessel contract specifies DP-capable vessels.	VOGA inspection or audit confirms vessels are DP capable.
Vessels perform DP trials as required by their PMS.		Vessels are required to conduct DP trials prior to entry into the 500 m restricted zone.	DP trials noted in ships log.
SIMOPS Plan defines controls to be implemented when		SIMOPS Plan shall define controls to be implemented when multiple vessels are in field.	SIMOPS Plan implemented. Audit records to confirm compliance.

multiple vessels are in field.			
Vessels contracted by VOGA have certified masters.		VOGA shall validate that vessel masters meet requirements of their company's Competency Management system (CMS).	Review of contractors CMS.
Vessels contracted by VOGA have systems to assist with tracking and identifying vessels in the general area.		VOGA shall validate that vessels are fitted with radar and Automatic Identification System (AIS).	VOGA inspection or audit confirms presence of working radar equipment.
Breakaway coupling on refuelling hose to prevent spill due to vessel loss of position.		Breakaway coupling is required to be installed on refuelling hoses.	Pre-hire inspection confirms presence of equipment.
Contractor bunkering equipment requirements: • Contractor's PMS includes bulk transfer hose maintenance and replacement schedule to ensure current certification and hoses are in good condition. • Fuel hoses have dry-break couplings and floatation. • Adequate number of appropriately stocked, located and maintained spill kits.		• All transfer hoses shall be maintained and confirmed currently certified in accordance with the relevant Contractor's PMS. • VOGA shall validate Contractor's fuel hoses will have dry-break couplings and floatation. • VOGA shall validate the presence of adequate number of appropriately stocked, located and maintained spill kits in accordance with vessel SOPEP/SMPEP (equivalent to class).	• VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date. • VOGA inspection confirms Contractor's fuel hoses have dry-break couplings and floatation. • VOGA inspection confirms presence of adequate number of appropriately stocked, located and maintained spill kits in accordance with vessel SOPEP/SMPEP (equivalent to class).
Contractor bunkering procedure includes: • Check hoses prior to bunkering.		Vessels compliant with Contractor bunkering procedure for the prevention of collisions and accidental release of MDO.	Records demonstrate bunkering operations undertaken in accordance with

• Monitoring of gauges, hoses, fittings and sea surface during bunkering. • Bunkering only in daylight hours. • No bunkering in marginal weather conditions.			Contractor bunkering procedure.
Reduction			
None identified	-	-	-
Mitigation			
Vessels will implement a SOPEP/SMPEP in the event of a spill.	EPO-ED-11	SOPEP/SMPEP (equivalent to class) procedures shall be available during vessel activities.	VOGA inspection or audit confirms SOPEP/SMPEP (equivalent to class) procedures are available on the activity vessels during well activities.
The NOPSEMA-accepted Oil Pollution Emergency Plan (OPEP) will be implemented in the event of any diesel spill to the marine environment.	EPO-ED-11	Oil spill response strategies shall be implemented in accordance with the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	Incident Action Plan (IAP) records.
The NOPSEMA-accepted Operational and Scientific Monitoring Plan (OSMP) will be implemented in the event of any diesel spill to the marine environment.	EPO-ED-11	Oil spill operational and scientific monitoring shall be implemented in accordance with the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	IAP records.
Limit the fuel volume on vessels to ensure modelled worst case MDO spill scenario from vessel collision cannot be exceeded.	EPO-ED-11	Vessels will have a maximum bunkering volume of 300 m^3 for a single fuel tank.	Fuel bunkering records and/or relevant purchase records.
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
None identified	-		-
ALARP Summary:			

The impacts and potential risks from an accidental release of MDO are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-3), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.

5.14.6 Acceptability Demonstration

Table 5-64: Acceptability demonstration – Accidental release of MDO

Acceptable level of impact/risk demonstrated	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-63).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy. Potential spills to be managed in accordance with Wandoo Emergency Response Plan [VOG-2000-RD-0017]/ Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].
Other requirements met	Yes – including: • Notice to Mariners issued via AMSA in a timely manner • Potential spills to be managed in accordance with SOPEP/SMPEP (equivalent to class) • Approved Conservation Advice for *Anous tenuirostris melanops* (Australian lesser noddy) (TSSC, 2015b) • Approved Conservation Advice for *Calidris canutus* (Red Knot) (DCCEEW, 2024b) • Approved Conservation Advice for *Calidris tenuirostris* (Great knot) (DCCEEW, 2024c) • Approved Conservation Advice for *Calidris ferruginea* (Curlew sandpiper) (DCCEEW, 2023a) • Approved Conservation Advice for *Papasula abbotti* (Abbott's booby) (TSSC, 2020a) • Conservation Advice for *Sternula albifrons* (little tern) (DCCEEW, 2025a) • Approved Conservation Advice for *Sternula nereis nereis* (fairy tern) (TSSC, 2011) • National Recovery Plan for Albatrosses and Petrels (2022) (DCCEEW, 2022) • Approved Conservation Advice for *Pristis zijsron* (green sawfish) (DEWHA, 2008b) • Approved Conservation Advice for *Pristis clavata* (dwarf sawfish) (DEWHA, 2009) • Sawfish and River Sharks Multispecies Recovery Plan: (*Pristis pristis, Pristis zijsron*, *Pristis clavata*, *Glyphis glyphis* and *Glyphis garricki*) (DoE, 2015)

	• Approved Conservation Advice for *Rhincodon typus* (whale shark) (TSSC, 2015c) • Recovery Plan for Marine Turtles in Australia, 2017-2027 (Commonwealth of Australia, 2017) • Approved Conservation Advice for *Dermochelys coriacea* (Leatherback Turtle) (DEWHA, 2008c) • Approved Conservation Advice for short-nosed sea snake (*Aipysurus apraefrontalis*) (DSEWPaC, 2011a).
RR < High (RRII)	Yes – Medium (RRIII).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-10 • EPO-ED-11 See Section 7 for further details.
Acceptability Summary: The impacts and potential risks of an accidental release of MDO have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-63), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.15 Unplanned: Accidental Release – Loss of Well Containment

5.15.1 Hazard report

Table 5-65: Hazard Report – Accidental release - LOWC

HAZARD	Accidental release - LOWC		
EP risk number	EP-ED-R15		
Activity/cause	Loss of Well Containment		
Extent	Extent of the Hydrocarbon Area and EMBA		
Potential impact description	Temporary decline in marine water quality. Increased toxicity and bioaccumulation in marine organisms from the ingestion of hydrocarbons. Injury or death of exposed marine fauna. Habitat impact where the spill reaches sensitive marine areas such as coral reefs or shorelines.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Water quality	Moderate (3)	Rare (A)	Low (RRIV)
Benthic habitats	Minor (2)	Rare (A)	Low (RRIV)
Coastal communities	Major (4)	Rare (A)	Medium (RRIII)
Marine fauna	Minor (2)	Rare (A)	Low (RRIV)
Protected and significant areas	Major (4)	Rare (A)	Medium (RRIII)
Other marine users	Minor (2)	Rare (A)	Low (RRIV)

First nations	Major (4)	Rare (A)	Medium (RRIII)
Relevant EPO(s)	EPO-ED-10 No unplanned discharge of hydrocarbons or chemicals to the marine environment. EPO-ED-11 Impacts to values and sensitivities are minimised in the event of a loss of hydrocarbons.		

5.15.2 Description of Hazard

A Loss of Well Containment (LOWC) has been determined as the worst-case credible scenario with the potential to lead to an uncontrolled release of reservoir hydrocarbons or other well fluids into the environment.

VOGA has conducted HAZID workshops to identify activities and causes which could result in a LOWC. These workshops have determined that for such a well control event to occur, it would require multiple physical and administrative barriers to fail concurrently or sequentially.

For a total LOWC to occur multiple levels of control must fail concurrently for this event to occur, such as:

- Primary well control - which is achieved when the hydrostatic pressure exerted by fluids above a hydrocarbon source is greater than the pore pressure at the source.
- Secondary well control - which is provided by the systems of mechanical devices which form, or are able to form, a pressure-containing envelope around the well to ensure that the well fluids remain under control. Secondary well control components include well casing, tubing, wellhead, BOPs and Xmas Trees and their associated control systems.

Loss of primary well control may occur due to:

- Intersection of a fracture, fault or old well bore
- Overpressure of the annuli.

Loss of secondary well control may occur due to:

- BOP failure
- Loss of a suspended load from vessel (operating near subsea wells) damages the wellhead and/or flowlines
- Failure of integrity of the defined well barrier envelope.

VOGA has determined that there is an extremely low probability that a total LOWC will occur. See Section 5.15.3.1 for further details on likelihood.

5.15.2.1 Spill Modelling

Stochastic spill modelling was undertaken to determine the trajectory of the worst-case credible accidental LOWC (RPS, 2024). The spill modelling was carried out using a purpose-developed oil spill trajectory and fates model, SIMAP (Spill Impact Mapping Analysis Program). This model is designed to simulate the transport and weathering processes that affect the outcomes of

hydrocarbon spills to the sea, accounting for the specific oil type, spill scenario, and prevailing wind and current circulation patterns (RPS, 2024). Table 5-66 summarises the spill model inputs and parameters.

The maximum credible spill scenario was identified as 26,678 m^3 (167,800 bbl) surface release of Wandoo crude over 35 days following a loss of well control (LOWC) at Kullingal.

Table 5-66: Summary of the oil spill model settings used by RPS (2024)

Model Settings	Scenario	
Scenario type	Accidental LOWC	
Location	Kullingal (the Prospect Area closest to Dampier)	
	Latitude*	Longitude*
	20° 10' 16.32" S	116° 24' 11.88" E
No. of spill simulations	100 per season	
Seasons	Summer (October to February) Winter (April to July) Transitional (March, August and September)	
Spill volume	26,678 m^3	
Oil type	Wandoo Crude	
Release depth	0 m (surface)	
Release duration	35 days	
Simulation length	56 days	

**Datum: WGS 1984*

Hydrocarbon Characteristics

Wandoo Crude (API 19.4) was used for this oil spill modelling study. The unweathered mixture has a density of 937.7 g/cm^3 (at 16°C), a dynamic viscosity of 161 cP and a pour point of -24°C, which ensures that this crude will remain in a liquid state over the annual temperature range observed. Wandoo Crude is composed of approximately 1.7% (by mass) of volatile hydrocarbons that will evaporate within the first 12 hours. A further 10.2% of the oil is characterised as the semi-volatile compounds that will likely evaporate within the first 24 hours when on the surface and the additional 33.1% represent the low volatiles which typically evaporate over several weeks. A relatively high proportion (55%) of hydrocarbon compounds is persistent, which are unlikely to evaporate and will decay over time. It is categorised as a Group IV (persistent) oil according to oil classifications for AMSA (2023).

Table 5-67 summarises the physical characteristics of Wandoo Crude.

Table 5-67: Hydrocarbon characteristics of Wandoo Crude (RPS, 2024)

Hydrocarbon characteristics	Wandoo Crude
Hydrocarbon Type	Wandoo Crude
API	19.4
Density (g/m^3)	937.7 (at 16 °C)

Dynamic viscosity (cP)		161 (at 25 °C)	
Pour point (°C)		-24.0	
Hydrocarbon property category		Group IV	
Hydrocarbon property classification		Persistent	
Hydrocarbon Component		Boiling point (°C)	% of Total
Volatiles	Non- persistent	<180	1.7
Semi-volatiles		180-265	10.2
Low volatiles		265-380	33.1
Residual	Persistent	>380	55.0

Weathering and Fate

A series of weathering tests were conducted (RPS, 2024) to illustrate the potential behaviour following a 50 m^3 instantaneous surface release of Wandoo crude when exposed to:

- 5 knot (2.6 m/s) constant wind speed, 27°C water temperature and currents
- Variable wind speeds (1 – 12 m/s or 2 to 24 knots), 27°C water temperature and currents.

The first case is indicative of the potential weathering rates under calm conditions that would not generate entrainment, while the second case would be more representative of the moderate winds experienced over the region.

The mass balance forecast for the constant wind case (Figure 5-3) shows that 13.0% of the crude is predicted to evaporate within 24 hours. The remaining hydrocarbon on the water surface will weather at a slower rate and be subject to more gradual decay through biological and photochemical processes (RPS, 2024).

In the variable wind speeds test (Figure 5-4), characterised by stronger average winds and breaking waves, there is an increased entrainment of the crude into the water column. Approximately 24 hours into the spill, the forecast indicates that 3.2% of the crude will have evaporated, with additional 93.9% expected to have entrained. Hence, less than 1% of floating oil remains on the water surface 24 hours into the spill (RPS, 2024).

Figure 5-3: Mass Balance Plot for an Instantaneous 50 m³ Surface LOWC of Wandoo Crude Subjected to a Constant 5 knot (2.6 m/s) Wind, Currents and 27°C Water Temperature (RPS, 2024)

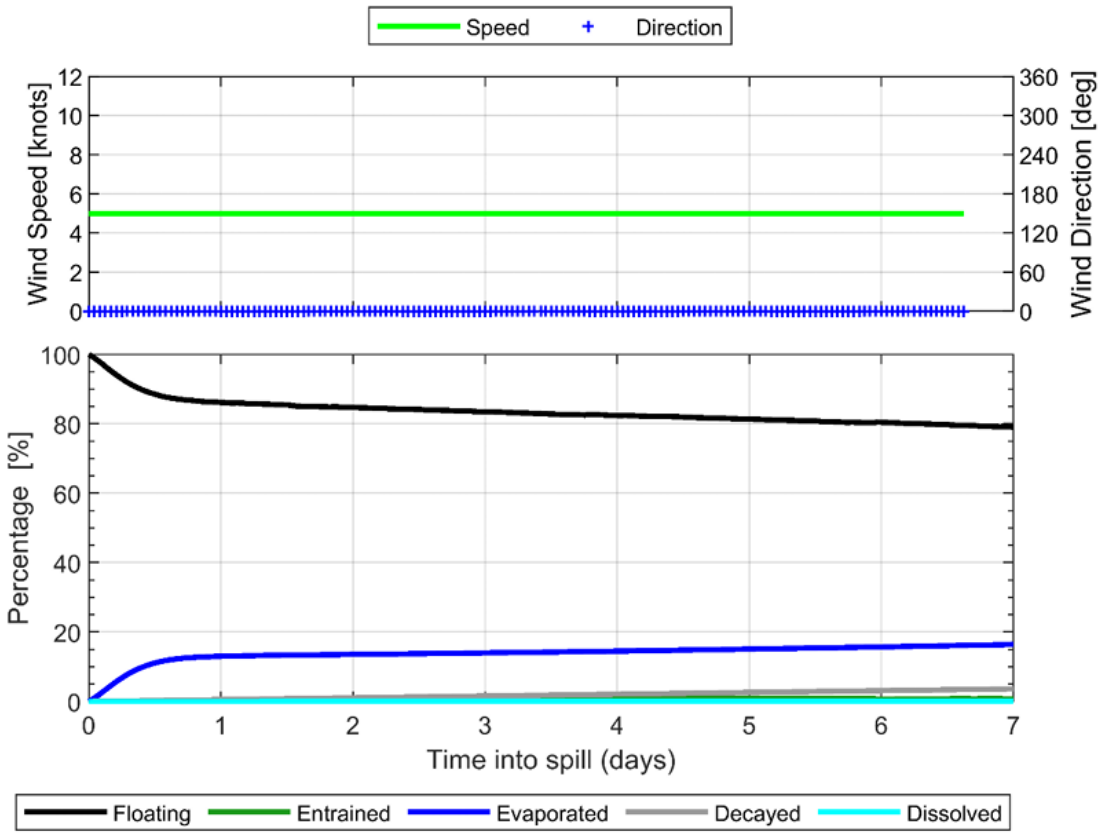
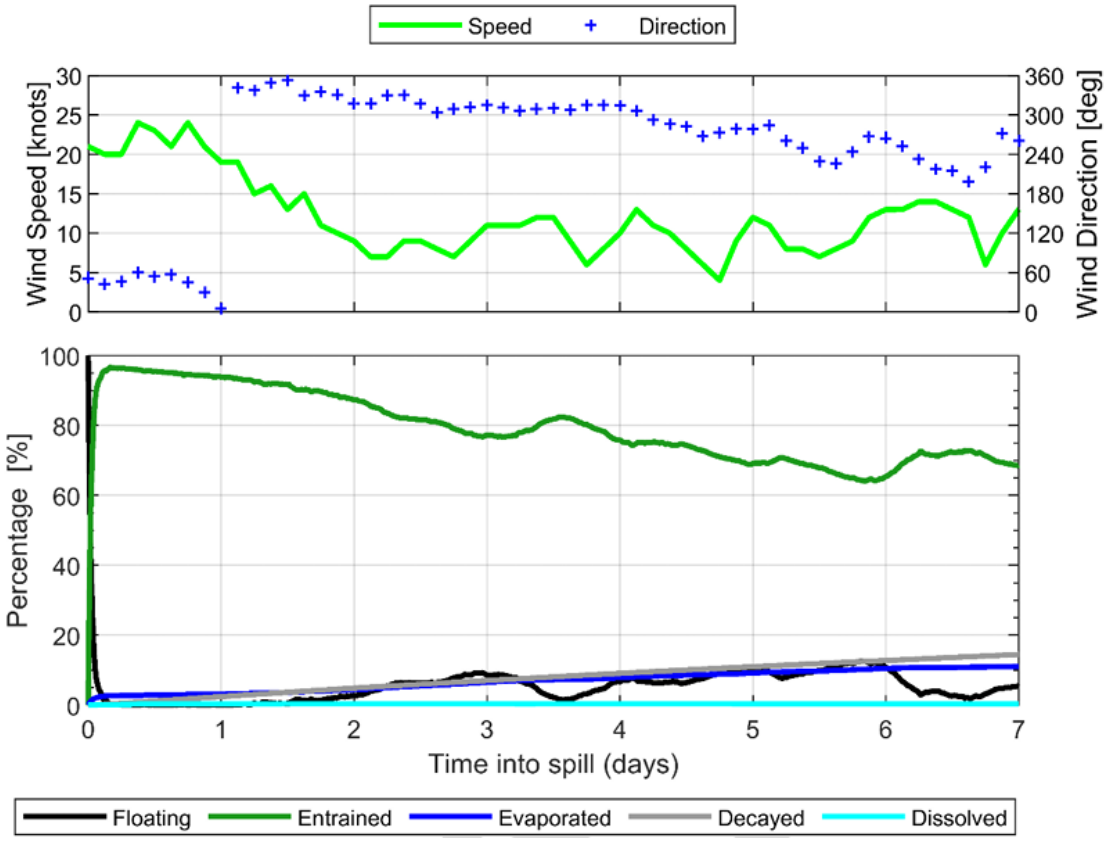


Figure 5-4: Mass Balance Plot for an Instantaneous 50 m³ Surface LOWC of Wandoo Crude Subjected to Variable Wind Speeds of 2 to 23 knots (1 – 12 m/s), Currents and 27°C Water Temperature (RPS, 2024)



Exposure Thresholds

The SIMAP model tracks oil concentrations to very low levels, therefore it is important to define meaningful threshold concentrations for the recording of contact by oil components and determining the probability of exposure at a location (calculated from the number of replicate simulations in which this contact occurred). The thresholds for surface, shoreline, and in-water oil (dissolved and entrained) used in this EP are based on those outlined by NOPSEMA in the Oil Spill Modelling Bulletin (NOPSEMA, 2019), which are summarised in Table 5-55 within Section 5.14.

Modelling Results

Table 5-68 provides a summary of the results from the stochastic modelling report (RPS, 2024; Appendix B) for an accidental LOWC of Wandoo Crude.

Table 5-68: Summary of the hydrocarbon modelling results for an accidental LOWC of Wandoo Crude (RPS, 2024)

Exposure values	Summary of worst-case predicted exposure
Surface exposure	
Low (1 g/m^2)	The maximum distance for floating surface hydrocarbon exposure at this threshold from the source was predicted to be 998 km. Mermaid Reef AMP (97%), Montebello AMP (79%) and the Glomar Shoals KEF (60%) recorded the highest probability of exposure at this threshold.
Moderate (10 g/m^2)	The maximum distance for floating surface hydrocarbon exposure at this threshold from the source was predicted to be 473 km. Glomar Shoals KEF (7%) recorded the highest probability of exposure at this threshold.
High (50 g/m^2)	The maximum distance for floating surface hydrocarbon exposure at this threshold from the source was predicted to be 25 km. No exposure at this threshold was predicted.
Shoreline exposure	
Low (10 g/m^2)	The highest probability of hydrocarbon accumulation on any shoreline at or above the low threshold was 100%. The highest probability of hydrocarbon accumulation for a specific shoreline cell was 92% (Barrow Island and Montebello Island). The minimum time to shore at or above the low threshold was 69 hours (Barrow Island and Montebello Islands). The maximum total volume of hydrocarbon ashore for a single spill trajectory was 4,550 m^3. For a specific shoreline, the maximum total volume was 2,570 m^3 (Barrow Island and Montebello Islands). The maximum length of hydrocarbon ashore above the low threshold for a single spill trajectory was 1,320 km. For a specific shoreline, the worst case simulation was 67 km (across Barrow Island and Montebello Islands).
Moderate (100 g/m^2)	The highest probability of hydrocarbon accumulation on any shoreline at or above the low threshold was 99%. The highest probability of hydrocarbon accumulation for a specific shoreline cell was 88% (Barrow Island and Montebello Islands). The minimum time to shore at or above the low threshold was 78 hours (Barrow Island and Montebello Islands). The maximum total volume of hydrocarbon ashore for a single spill trajectory was 4,431 m^3. For a specific shoreline, the maximum total volume was 2,565 m^3 (Barrow Island and Montebello Islands). The maximum length of hydrocarbon ashore above the low threshold for a single spill trajectory was 588 km. For a specific shoreline, the worst case simulation was 59 km (Barrow Island and Montebello Islands).
High (500 g/m^2)	The highest probability of hydrocarbon accumulation on any shoreline at or above the low threshold was 82%. The highest probability of hydrocarbon accumulation for a specific shoreline cell was 75% (Barrow Island and Montebello Islands). The minimum time to shore at or above the low threshold was 111 hours (Barrow Island and Montebello Islands). The maximum total volume of hydrocarbon ashore for a single spill trajectory was 3,474 m^3. For a specific shoreline, the maximum total volume was 2,493 m^3 (Barrow Island and Montebello Islands).

Exposure values	Summary of worst-case predicted exposure
	The maximum length of hydrocarbon ashore above the low threshold for a single spill trajectory was 122 km. For a specific shoreline, the worst case simulation was 34 km (Barrow Island and Montebello Islands).
In-water exposure - dissolved	
Low (10 ppb)	The maximum distance for dissolved hydrocarbons at this exposure from the source was predicted to be 790 km. The minimum time to dissolved hydrocarbon exposure at any given receptor(s) was 26 hours (Montebello AMP). The highest probability of intersect was with the Montebello AMP at 89 %.
Moderate (50 ppb)	The maximum distance for dissolved hydrocarbons at this exposure from the source was predicted to be 425 km. The minimum time to dissolved hydrocarbon exposure at any given receptor(s) was 38 hours (Montebello AMP). The highest probability of intersect was with the Montebello Islands AMP at 12%.
High (400 ppb)	No exposure at this threshold was predicted.
In-water exposure - entrained	
Low (10 ppb)	The maximum distance for entrained hydrocarbons at this exposure from the source was predicted to be 1,302 km. The minimum time to dissolved hydrocarbon exposure at any given receptor(s) was 21 hours (Montebello AMP). The highest probability of intersect was with the Montebello AMP at 99%.
High (100 ppb)	The maximum distance for entrained hydrocarbons at this exposure from the source was predicted to be 1,037 km. The minimum time to dissolved hydrocarbon exposure at any given receptor(s) was 21 hours (Montebello AMP). The highest probability of intersect was with the Montebello AMP at 96%.

5.15.3 Impact and Risk Evaluation

The accidental LOWC of Wandoo Crude may result in:

- A change in water quality
- Oiling of shorelines.

The potential risks from a change in water quality caused by the accidental LOWC of Wandoo Crude include:

- Change in marine fauna behaviour
- Injury/mortality to marine fauna
- Change in ecosystem dynamics and conservation values
- Changes to the functions, interests, or activities of other marine users
- Change in submerged cultural heritage.

The following receptors within the Operational Area may be impacted:

- Plankton
- Benthic habitats
- Coastal communities
- Marine fauna, such as:
  - plankton
  - benthic invertebrates
  - seabirds and shorebirds
  - fish, sharks and rays
  - marine mammals
  - marine reptiles
- Protected and significant areas
- Social and economic environment, such as:
  - fisheries and aquaculture
  - other marine users
- First Nations values.

5.15.3.1 Risk Assessment

Water Quality

Change in Water Quality

The accidental release of Wandoo Crude into the marine environment as a result of a LOWC will result in a localised reduction in the water quality within the receiving marine environment. A visible oil sheen on the water surface may also occur in the event of a hydrocarbon spill.

As discussed in Section 5.14.3.1, the marine water quality within the Hydrocarbon Area and EMBA is expected to be representative of the typically pristine and high-water quality found in offshore WA waters and previous surveys identified no detectable hydrocarbons. The hydrocarbon modelling predicted that the maximum distance for floating surface hydrocarbon exposure at any threshold would extend out to 998 km, and 790 km and 1,302 km for dissolved and entrained hydrocarbons, respectively (Table 5-68; RPS, 2024). Therefore, changes to water quality will occur outside of the Operational Area in the unlikely event of a LOWC.

Due to the highly dispersive environment typical of the offshore area, high levels of entrainment may be expected for the persistent hydrocarbon depending on the weather conditions, with 0% up to 93.9% of the volume having the potential to entrain within 24 hours of the release (5.15.2.1). As such, changes to water quality may be medium-term. The consequence ranking of ‘3’ (Moderate) was assigned to a change in water quality due to the duration of change and extent of the spill outside the Operational Area.

Benthic Habitats

Benthic habitats have been assessed based on the hydrocarbon exposure at the thresholds that have the potential to cause ecological impacts (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using moderate hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved) and the high hydrocarbon exposure for in-water (entrained) hydrocarbons. This is defined as the Hydrocarbon Area.

Table 5-69 evaluates the potential impact that hydrocarbon spills for this activity may have on benthic habitat receptors found within the Hydrocarbon Area.

Table 5-69: Risk assessment for an accidental LOWC of Wandoo Crude – benthic habitats and communities

Benthic habitats and communities
Exposure evaluation:
The seafloor in the Hydrocarbon Area is comprised of fine silt/sand substrates with low densities of benthic communities (Section 3.4.1). Biologically significant coral reef formations are found within the nearshore shallow areas of islands within the Hydrocarbon Area (i.e. Montebello Islands). The seafloor of the deeper waters of the NWS is primarily a soft sediment habitat that can support scavengers, benthic filter feeders and epifauna communities (Section 3.4.1). Any areas of exposed hard substrate are likely to be colonised by deep water filter-feeding organisms, such as hydroids and sponges. Key areas of seagrass habitats are found within the nearshore shallow areas of the Hydrocarbon Area (i.e. the Ningaloo Reef area). Macroalgae is widespread within shallower hard substrate areas within the Hydrocarbon Area. Due to the widespread nature of macroalgal habitat within the Hydrocarbon Area, there are no identified areas of significant environmental value. The maximum distance for dissolved hydrocarbons at moderate exposure (50 ppb) from the source was predicted to be 425 km and 1,037 km for entrained hydrocarbons at the high threshold (100 ppb). In general, only a small number of residual oil types are sufficiently dense enough to sink when spilled into the marine environment. Typically hydrocarbons with an API value less than 7 will be denser and may sink in seawater, and an API less than 10 will be denser for freshwater and may sink (EPA, 2006). The API for Wandoo Crude is 19.4 (Table 5-67), as such it will float on the surface or remain suspended within the water column (typically within 0-10m) when released into the marine environment. The hydrocarbon will only sink if it is mixed with denser sediments resulting in sedimentation to occur. This can be common in areas of large tidal action (ITOPF, 2024).
Predicted impact:
In-water
<u>Corals</u> Exposure of entrained hydrocarbons to shallow subtidal corals has the potential to result in lethal or sublethal toxic effects, resulting in acute impacts or death at moderate to high exposure thresholds (Shigenaka, 2011). Physical effects from entrained crude hydrocarbons have the potential to coat contacted coral reefs. The phenomena of smothering of exposed coral surfaces or polyps by hydrocarbon spills has been reported where very large oil spill quantities, or very sticky oil slicks, have been encountered. Contact with corals may lead to reduced growth rates, tissue decomposition, impaired fertilization and larval settlement, and poor resistance and mortality of sections of reef (NOAA, 2010a). In-water exposure (dissolved or entrained) at relevant exposure thresholds is typically only predicted to occur within the upper 0–10 m of the water column, therefore, corals found in water depths below 10 m are not anticipated to be impacted by in-water hydrocarbon exposure.

Seagrass

In-water exposure (dissolved or entrained) is only predicted to occur within the upper 0 – 10 m of the water column (RPS, 2024); therefore, benthic habitat, such as seagrass, within intertidal or shallow nearshore waters has the potential to be exposed.

Intertidal and subtidal seagrass ecosystems can be damaged in a number of ways. Direct mortality from smothering can occur, however, sub-lethal impacts from smothering are more likely to occur than lethal impacts because much of seagrasses' biomass is underground in their rhizomes and less likely to be exposed to hydrocarbons (Zieman et al., 1984). However, exposure also can take place via uptake of hydrocarbons through plant membranes and seeds may be affected by contact with oil contained within sediments (NRDA, 2012). Petroleum fractions absorbed into the seagrass tissues, can also lower the organism's tolerance to other stressors and reduce growth rates (Zieman et al., 1984) (Runcie et al., 2010).

Studies of offshore benthic seaweeds in the northwest Gulf of Mexico prior to and after the Macondo well blowout at Sackett and Ewing banks (in water depths of 55 – 75 m) found a dramatic die-off of seaweeds after the spill (60 species pre-spill compared with 10 species post-spill) (Felder et al., 2014). However, these banks are exposed to influences from Mississippi River discharges that vary year to year, so definitive links to the oil spill were not possible. Petroleum residues were observed on Ewing Bank and it is possible that this may have caused localised mortalities.

Entrained hydrocarbon within the water column can affect light qualities and the ability of macrophytes, including seagrasses and macroalgae, to photosynthesise.

Macroalgae

In-water exposure (entrained and dissolved) is only predicted to occur within the upper 0-10 m of the water column; therefore, benthic habitats, such as macroalgae, within intertidal or shallow nearshore waters has the potential to be exposed.

Intertidal macroalgal beds are more prone to hydrocarbon spills than subtidal beds because, although the mucous coating of the macroalgae prevents oil adherence, oil that is trapped in the upper canopy may be more persistent, which impacts site-attached species. Additionally, when oil sticks to dry fronds on the shore, they can become heavy and break as a result of wave action (IPIECA, 2002).

The physical effects of smothering, fouling and asphyxiation has been documented from oil contamination in marine plants (Blumer, 1971; Cintron et al., 1981). In macroalgae, oil can act as a physical barrier for the diffusion of CO_2 across cell walls (O'Brien and Dixon, 1976). The effect of hydrocarbons, however, is largely dependent on the degree of direct exposure and how much of the hydrocarbon adheres to algae, which will vary depending on the oils physical state and relative 'stickiness'. The morphological features of macroalgae, such as the presence of a mucilage layer or the presence of fine 'hairs' will influence the amount of hydrocarbon that will adhere to the algae.

A review of field studies conducted after spill events by Connell et al. (1981) indicated a high degree of variability in the level of impact, but in all instances, the algae appeared to be able to recover rapidly from even very heavy oiling. The rapid recovery of algae was attributed to the fact that for most algae, new growth is produced from near the base of the plant while the distal parts (which would be exposed to the oil contamination) are continually lost. Other studies have indicated that kelp beds oiled by crude oil had a 90% recovery within 3-4 years of impact, however full recovery to pre-spill diversity may not occur for long periods after the spill (French-McCay, 2004).

The toxicity of hydrocarbons to macroalgae varies for the different macroalgal life stages, with water-soluble hydrocarbons more toxic (Van Overbeek and Blondeau, 1954; Kauss et al., 1973; cited in O'Brien and Dixon, 1976). Toxic effect concentrations for hydrocarbons and algae have varied greatly among species and studies,

Benthic habitats and communities
ranging 0.002–10,000 ppm (Lewis and Pryor, 2013). The sensitivity of gametes, larva and zygote stages, however, have all proven more responsive to oil exposure than adult growth stages (Thursby and Steele, 2004; Lewis and Pryor, 2013). Entrained hydrocarbon within the water column can also affect light qualities and the ability of macrophytes, including seagrasses and macroalgae, to photosynthesise.
Predicted impact summary:
There is a high probability of intersect of in-water hydrocarbons with receptors where benthic habitats, such as coral, seagrass, and macroalgae, are known to occur (Section 5.15.2.1). However, these benthic habitats are typically restricted to shallow nearshore and intertidal waters only, outside of the main exposure area predicted within 0 – 10 m of the sea surface. Any impacts to benthic habitats and associated communities is anticipated to be localised and short-term, with recovery expected within 5 years. As such, a consequence ranking of '2' (Minor) was assigned.

Coastal Communities

Coastal communities have been assessed based on the hydrocarbon exposure based on the thresholds that have the potential to cause ecological impacts (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using moderate hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved) and the high hydrocarbon exposure for in-water (entrained) hydrocarbons. This is defined as the Hydrocarbon Area.

Table 5-70 evaluates the potential impact that hydrocarbon spills for this activity may have on coastal receptors found within the Hydrocarbon Area.

Table 5-70: Risk assessment for an accidental LOWC of Wandoo Crude – coastal communities

Mangroves		
Exposure evaluation:		
Regionally significant areas of mangrove communities are found within the Dampier Archipelago, Montebello Islands, Ningaloo Coast and scattered areas along the coast between Onslow and just north of Port Hedland (Section 3.4.2.1). The spill modelling identified that the highest probability of hydrocarbon accumulation on a specific shoreline at or above the moderate threshold (100 g/m^2) was 88% at the Barrow Island and Montebello Islands shoreline cell. The minimum time to shore was 3.25 days (78 hours) and the maximum total volume of hydrocarbon ashore for a single spill trajectory was 2,565 m^3 (Section 5.14.2.1). Montebello Island also recorded the maximum length of hydrocarbon ashore above the moderate threshold (59 km).		
Predicted impact:		
Surface	**In-water**	**Shoreline**
Mangroves are considered to have a high sensitivity to hydrocarbon exposure. The severity of exposure for mangroves depends on the amount and type of oil entering the intertidal zone (Duke, 2016). In contrast to light oils, heavy oils with high specific gravity (such as Wandoo Crude) are particularly proficient at coating and smothering small plants and aerial root systems (Hensel et al., 2014; Connolly et al., 2020). Mangroves can be killed by heavy or viscous oil, or emulsification, that covers the trees' breathing pores thereby asphyxiating the subsurface roots, which depend on the pores for oxygen.	Mangroves can also take up in-water hydrocarbons from contact with leaves, roots or sediments, and it is suspected that this uptake causes defoliation through leaf damage and tree death (Wardrop et al., 1987). Acute impacts to mangroves can be observed within weeks of exposure, whereas chronic impacts may day months to years to detect.	Oil can enter mangrove forests when the tide is high and be deposited on the aerial roots and sediment surface as the tide recedes. The physical smothering of aerial roots by standard hydrocarbons can block the trees' breathing pores used for oxygen intake and result in the asphyxiation of sub-surface roots (International Petroleum Industry Environmental Conservation Association (IPIECA, 1993). Burns et al. (1993) identified that mangrove communities may take up to 20 years or longer to recover from the toxic impact of catastrophic oil spills. This is due to the long term persistence of oil trapped in anoxic sediments and subsequent release into the water column. This result was a part of the findings from a long term assessment of an oil spill of medium-weight crude oil which impacted a coastal fringe mangrove ecosystem in Panama (Burns et al., 1993). Similarly, other studies have determined that mangroves can take more than 30 years to recover from severe oil

		spill impacts. (NOAA, 2014b). A recent long-term study by Connolly et al. (2020) on the recovery of mangroves to the Era tanker spill in Spence Gulf of southern Australia analysed aerial images which showed there no recovery in heavily oiled areas for 10 years following the oiling event and only 50% of the mangrove canopy had recovered after 25 years. Predictive modelling indicates complete mangrove recovery to heavy oiling could therefore take up to 55 years, longer than anticipated (Connolly et al., 2020).
Predicted impact summary:		
Impacts to significant coastal mangrove communities located at Dampier Archipelago, Montebello Islands, Ningaloo Coast and scattered areas along the coastline may occur given the extent of the Hydrocarbon Area and physical characteristics of the Wandoo Crude, as a persistent hydrocarbon, which is predicted to remain either floating at the sea surface, or persist as entrained droplets within the water column, depending on the weather conditions (Section 5.15.2.1), until it slowly decays or degrade over time following the release into the marine environment. Furthermore, limited weathering is expected prior to shoreline impact, with the minimum time to shoreline accumulation predicted after ~3 days (Section 5.15.2.1). Given the high sensitivity of mangrove communities to hydrocarbons and the potential recovery rates, the potential consequence to mangroves is persistent but reversible, long-term impacts, to species or habitats of recognized conservation value or to local ecosystem function. As such, a consequence ranking of '4' (Major) was assigned.		
Saltmarsh		
Exposure evaluation:		
Saltmarsh habitat is common within tidal flats or wetland habitats within the wider EMBA area and Hydrocarbon Area (Section 3.4.2.2), with regionally significant saltmarsh habitats found along the Pilbara coastline, including Barrow Island and the Montebello Islands (Figure 3-5). The spill modelling identified that the highest probability of hydrocarbon accumulation on a specific shoreline at or above the moderate threshold (100 g/m^2) was 88% at the Barrow Island and Montebello Islands shoreline cell. The minimum time to shore was 3.25 days (78 hours) and the maximum total volume of hydrocarbon ashore for a single spill trajectory was 2,565 m^3 (Section 5.14.2.1). Montebello Island also recorded the maximum length of hydrocarbon ashore above the moderate threshold (59 km).		
Predicted impact:		
Shoreline		
Saltmarsh is considered to have a high sensitivity to hydrocarbon exposure. Hydrocarbon (in liquid form) will readily adhere to the marshes, coating the stems from tidal height to sediment surface. However, heavy oil coating is unlikely due to the highly volatile nature of the condensate hydrocarbon.		

Oil can enter saltmarsh systems during the tidal cycles if the estuary/inlet is open to the ocean. Saltmarsh vegetation offers a large surface area for oil absorption and tends to trap oil. Similar to mangroves, this can lead to a patchy distribution of the oil and its effects, because different places within the inlets are at different tidal heights.

Evidence from case histories and experiments shows that the damage resulting from oiling, and recovery times of oiled marsh vegetation, are highly variable. In areas of light to moderate oiling where oil is mainly on perennial vegetation with little penetration of sediment, the shoots of the plants may be killed but recovery can be relatively rapid, occurring the following growing season or earlier. However, when oil penetrates the soil and the initial mortality of the vegetation is extensive, recovery to reference conditions may take 3 – 4 years (Hester and Mendelssohn, 2000).

Predicted impact summary:

Impacts to saltmarsh habitat common within tidal flats or wetland habitats along the Pilbara coastline and at certain offshore islands within the Hydrocarbon Area may occur given the extent of the Hydrocarbon Area and physical characteristics of the Wandoo Crude, as a persistent hydrocarbon, which is predicted where limited weathering is expected prior to shoreline impact, with the minimum time to shoreline accumulation predicted after ~3 days (Section 5.15.2.1).

These habitats are considered highly sensitive to hydrocarbons. Previous studies have identified that recovery rates following heavy oiling may take 3 – 4 years (Hester and Mendelssohn, 2000).

To account for their sensitivity to hydrocarbons, the potential consequence to saltmarsh habitats has been assessed conservatively, on the potential for localised, medium-term impacts, to species or habitats of recognized conservation value or to local ecosystem function. As such, a consequence ranking of '3' (Moderate) was assigned.

Beaches and mudflats

Exposure evaluation:

Intertidal beaches and mudflats, sandy beaches, rocky beaches and intertidal reef platforms occur along the mainland coastline and island shores within the Hydrocarbon Area and the wider EMBA region.

Two intertidal beach/mudflat areas of international conservation significance occur within the Hydrocarbon Area (RPS, 2024):

- Bandicoot Bay, Barrow Island
- Eighty Mile Beach

Bandicoot Bay is a Conservation Reserve within the Montebello/Barrow Islands Marine Management Area. Eighty Mile Beach is listed under the Ramsar Convention (Section 4.6.6) and has been assigned specific protection under the EPBC Act (Section 3.4.2.3). Eighty-mile Beach Ramsar site represents the greatest extent of continuous intertidal mudflat in excellent condition within the Northwest IMCRA bioregion.

The spill modelling identified that the highest probability of hydrocarbon accumulation on a specific shoreline at or above the moderate threshold (100 g/m^2) was 88% at the Barrow Island and Montebello Islands shoreline cell. The minimum time to shore was 3.25 days (78 hours) and the maximum total volume of hydrocarbon ashore for a single spill trajectory was 2,565 m^3 (Section 5.14.2.1). Montebello Island also recorded the maximum length of hydrocarbon ashore above the moderate threshold (59 km).

A review of the hydrocarbon spill modelling report also predicted a low probability of hydrocarbon accumulation at or above the moderate threshold (100 g/m^2) for Eighty Mile Beach (1-11%), with minimum time to shore predicted as ~31 days (>746 hours) (RPS, 2024).

Sandy beaches are a dominant habitat type within the Hydrocarbon Area, with extensive stretches found on Montebello and Barrow Islands, other offshore island, and the coastline along the mainland within the Hydrocarbon Area, such as Eighty Mile Beach and the Ningaloo Coast (Section 3.4.2.5).

Rocky shorelines are found across the region, forming from limestone pavement extending out from the beach into subtidal zones, such as along the Ningaloo Coast and North West Cape (Section 3.4.2.4). The hydrocarbon spill modelling report (RPS, 2024) predicted a low probability of hydrocarbon accumulation at or above the moderate threshold (100 g/m^2) for along the Ningaloo Coast and North West Cape (<45%), with minimum time to shore predicted as ~10 days (>238 hours) (RPS, 2024).

Predicted impact:

Shoreline

Hydrocarbons can become concentrated as it strands ashore. However, most of the oil is concentrated along the high tide mark while the lower/upper parts are often untouched (IPIECA, 1995).

Intertidal beaches/mudflats

Intertidal beaches and mudflats in the region host a range of infauna, including molluscs and polychaetes that are likely to be an important food source for wading birds (DoE, 2015c). Shoreline accumulation of hydrocarbons can smother the habitat, resulting in a range of sub-lethal and potentially lethal impacts to the range of infauna species.

Under most circumstances heavy oil will not penetrate the fine sediments found on mudflats and will instead remain sitting on the surface (ITOPF, 2014). The reworking of sediment of a burrowing species, or the reworking during sever storm events may result in oil being incorporated into the fine grain sediment, becoming locked into the sediment layers. In these typically sheltered environments, where oxygen levels are low, very little degradation is expected to occur (ITOPF, 2014). As such, mudflats are expected to take longer than high energy shorelines exposed to high-energy wave and tidal action, to recover to pre-spill state.

The influence of tidal action and wave washing are expected to lead to increase levels of weathering of any hydrocarbons in the intertidal area and reduce the level of smothering or toxicity effects to exposed fauna along shorelines (ITOPF, 2024).

Rocky shorelines/intertidal reef platforms

Rocky shorelines provide habitats for invertebrates (e.g. sea anemones, sponges, sea-squirts, molluscs), and can also be utilised by bird species; noting that foraging and breeding/nesting typically occurs above high tide line. The sensitivity of a rocky shoreline to oiling is dependent on a number of factors including its topography and composition, position, exposure to oceanic waves and currents etc. Exposed rocky shorelines have been shown to be less sensitive than sheltered rocky shorelines.

The impact of oil on any organism depends on the toxicity, viscosity and amount of oil, on the sensitivity of the organism and the length of time it is in contact with the oil. Even where the immediate damage to rocky shores from oil spills has been considerable, it is unusual for this to result in long-term damage and the communities have often recovered within 2 or 3 years (IPIECA, 1995).

Sandy beaches

Sandy beaches provide habitat for a diverse assemblage (although not always abundant) of infauna (including nematodes, copepods and polychaetes); and macroinvertebrates (e.g. crustaceans). As discussed within Section 3.4.2, sandy beaches provide important turtle nesting habitat, particularly at the Barrow/Montebello/ Lowendal islands and Ningaloo Coast.

There is relatively limited information on the effects of oil spills on intertidal sand beach invertebrates from field-based studies. In general, majority of the previous studies have documented a measurable reduction in abundance and species diversity caused mostly by mortality and oil fouling; and a recovery phase, where there is an increase in dominance of opportunistic species, followed by the return of species characteristic of the assemblage, indicating the start of the recovery (Bejarano and Michel, 2016).

A sandy beach may also allow oil to percolate through the sand or become successively buried and uncovered over tidal cycles of sediment build-up, and erosion from various wave and wind actions; hence increasing its ability to hold more oil ashore (ITOPF, 2014). This is more common for lower viscosity oils, such as condensates and marine diesels (ITOPF, 2014), rather than heavier, highly viscous oils, such as Wandoo Crude.

Although evidence from several oil spills indicates that oil has the potential to persist in sand beaches, their links with direct effects to invertebrate communities are difficult to quantify. The biological recovery of species found on sandy beaches depend on several factors, such as site-specific physical properties and processes of the beach itself (e.g. sand grain size, beach exposure), the degree of oiling, depth of oil burial, and biological factors (e.g. species-specific life-history traits) (Bejarano and Michel, 2016). Recovery of affected communities ranges from several weeks to several years, with longer recoveries generally associated with physical factors that facilitate oil persistence, or when shoreline clean-up activities are absent on heavily oiled beaches (Bejarano and Michel, 2016).

Studies conducted on the impact of the Deepwater Horizon oil spill, which impact more than 965 km of sandy beach from Florida to Texas, show that sandy beaches have naturally occurring microbial biodegradation capabilities to facilitate hydrocarbon degradation (Kostka et al., 2011, and Mortazavi et al., 2013 in Bejarano and Michel, 2016). Significant biodegradation is expected to occur within 5 years for most sandy beach. In the case of beaches with weak tidal flushing, low energy waves, and low oxygen concentration biodegradation is expected to take significantly longer (OSAT, 2011). The occurrence of oil burial, in the incorporation of the oil into the sediments of the supratidal, intertidal, and nearshore subtidal habitats, from wave and tidal action and severe weather fronts, can lead to extensive persistence of oil within the habitat (Michel et al., 2016).

Predicted impact summary:

Impacts to Intertidal mudflats, sandy beaches, rocky beaches and intertidal reef platforms which are dominant habitats to occur within the Hydrocarbon Area and the wider EMBA may occur given the extent of the Hydrocarbon Area and physical characteristics of the Wandoo Crude, as a persistent hydrocarbon, which is predicted where limited weathering is expected prior to shoreline impact, with the minimum time to shoreline accumulation predicted after ~3 days (Section 5.15.2.1).

Due to the volume predicted to accumulate on the shorelines, the shoreline sensitivity, and expected time to impact, the potential consequence to sandy and rocky beaches and intertidal mudflat habitats has been assessed conservatively, on the potential for localised, medium-term impacts, to species or habitats of recognized conservation value or to local ecosystem function. As such, a consequence ranking of '3' (Moderate) was assigned.

Marine Fauna

Marine fauna has been assessed based on the hydrocarbon exposure based on the thresholds that have the potential to cause ecological impacts (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using moderate hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved) and the high hydrocarbon exposure for in-water (entrained) hydrocarbons. This is defined as the Hydrocarbon Area.

Table 5-71 evaluates the potential impact that hydrocarbon spills for this activity may have on marine fauna receptors found within the Hydrocarbon Area.

Table 5-71: Risk assessment for an accidental LOWC of Wandoo Crude - marine fauna

<table>
<tr><th colspan="2">Plankton</th></tr>
<tr><td colspan="2">Exposure evaluation:</td></tr>
<tr><td colspan="2">Plankton has been identified as a receptor that may be present within the Hydrocarbon Area.
As discussed in Section 3.4.3.1, plankton are found in nearshore and open waters beneath the surface and form the basis for the marine food web, including whales and whale sharks which migrate through the Hydrocarbon Area . These organisms migrate vertically through the water column to feed in surface waters at night and, when doing so, may be exposed to surface hydrocarbons and, to a greater extent, hydrocarbons dissolved or entrained in the water column (NRDA, 2012).
Plankton species are known to be sensitive to the toxic effects of oil at low concentrations and large numbers of planktonic organisms may be affected in the event of a spill event (ITOPF, 2014). Plankton risk exposure through ingestion, inhalation and dermal contact.
The maximum distance for dissolved hydrocarbons the moderate exposure threshold was predicted to be 425 km, and 1,037 km for entrained thresholds at the high threshold (5.15.2.1). The maximum distance for floating surface hydrocarbon exposure at this threshold from the source was predicted to be 473 km.</td></tr>
<tr><td colspan="2">Predicted impact:</td></tr>
<tr><td>Surface</td><td>In-water</td></tr>
<tr><td>Phytoplankton (photosynthetic organisms) can accumulate rapidly, due to their small size and high surface area to volume ratio, therefore populations are typically not sensitive to the impacts of oil (Hook et al., 2016). However, if phytoplankton are exposed to hydrocarbons at the sea surface, their ability to photosynthesise via smothering may be directly affected and would have implications for the next trophic level in the food chain (e.g. small fish) (Hook et al., 2016).
In addition, the presence of surface hydrocarbons, in particular thick oil slicks, may result in a reduction of light penetrating the water column, which may again affect the rate of photosynthesis which may inhibit growth, particularly in instances where there is prolonged presence of surface hydrocarbons over an extensive area (Volkman et al., 1994).</td><td>Zooplankton (protozoans and animals) are vulnerable to hydrocarbons due to their small size and high surface area to volume ratio. Some zooplankton also have high lipid content, which facilitates hydrocarbon uptake and bioaccumulation (Hook et al., 2016). Water column organisms that come into contact with oil risk exposure through ingestion, inhalation and dermal contact (NRDA, 2012), can cause immediate mortality or declines in egg production, hatching rates and a decline in swimming speeds (Hook et al., 2016).
However, any direct effects on plankton communities from spilled hydrocarbons is expected to be localised and temporary, as reproduction by survivors or migration from unaffected areas is likely to rapidly replenish any losses (Volkman et al., 1994). Furthermore, the proximity of nutrient-rich seasonal upwelling events which occur within the vicinity will further assist recovery rates.
Once background water quality conditions have re-established, the plankton community may take weeks to months to recover due to short generation times (ITOPF, 2011a), allowing for seasonal influences on the assemblage characteristics.</td></tr>
</table>

Predicted impact summary:
Plankton populations are numerous and widespread and expected to rapidly recover following an accidental LOWC. Due to the highly dispersive environment of the offshore environment, and the rapid generation anticipated for plankton populations following an impact, any impacts to plankton from exposure to Wandoo Crude are anticipated to be reversible, short-term, with relatively rapid recovery expected. As such, a consequence ranking of '2' (Minor) was assigned.
Benthic invertebrates
Exposure evaluation:
Benthic invertebrates may present within the Hydrocarbon Area (Section 3.4.3.2) and may be exposed to hydrocarbons following an accidental release of MDO. The benthic invertebrates within the Hydrocarbon Area are anticipated to be comparable to similar sites within the NWS region, of low abundance but highly diverse species, comprised largely of polychaete worms, crustaceans, echinoderms, and molluscs. (Rainer, 1991). In general, only a small number of residual oil types are sufficiently dense enough to sink when spilled into the marine environment. Most hydrocarbons will float on the surface or remain suspended within the water column (in general within the top 0-10m). Most hydrocarbons will only sink if mixed with denser sediments, common in areas of large tidal action (ITOPF, 2024). The maximum distance for dissolved hydrocarbons the moderate exposure threshold was predicted to be 425 km, and 1,037 km for entrained thresholds at the high threshold (5.15.2.1).
Predicted impact:
In-water
Entrained and dissolved hydrocarbons can have negative impacts on marine invertebrates and associated larval forms. Impacts to some adult species (e.g. crustaceans) is reduced as a result of the presence of an exoskeleton, while others with no exoskeleton and larval forms may be more prone to impacts. Exposure to microscopic oil droplets may also impact aquatic biota especially filter feeders (French-McCay, 2009). Localised impacts to larval stages may occur which could impact population recruitment. Other possible impacts from the presence of dispersed and non-dispersed oil include effects of oxygen depletion in bottom waters due to bacterial metabolism of oil (and/or dispersants), and light deprivation under surface oil (NRDA, 2012). Water quality in benthic habitats exposed to entrained hydrocarbons would be expected to return to background conditions within weeks to months of contact. Several studies have indicated that rapid recovery rates may occur even in cases of heavy oiling (National Academies Press, 2003).
Predicted impact summary:
Given the levels of entrainment expected following a LOWC, 0-93.9% depending on the weather conditions (Section 5.15.2.1), exposure to benthic invertebrate which filter feed may occur. However, benthic invertebrate are typically restricted to shallow nearshore and intertidal waters only, outside of the main exposure area predicted within 0 – 10 m of the sea surface, indicating that the coating of benthic assemblages and the subsequent prolonged exposure to hydrocarbons is unlikely following a LOWC.

Therefore, any impacts to benthic invertebrates from exposure to hydrocarbons following a LOWC are anticipated to be short-term with recovery expected. As such, a consequence ranking of '2' (Minor) was assigned.

Seabirds and shorebirds

Exposure evaluation:

Several threatened, migratory and/or listed marine seabird and shorebird species in the region have the potential to be rafting, resting, diving and feeding within the area predicted to be contacted by surface hydrocarbons; diving or foraging within in-water hydrocarbons; and foraging or nesting within shoreline exposure (Section 3.4.3.3).

Four breeding BIAs for seabirds intersect the Hydrocarbon Area (Section 3.4.3.3), including:

- Fairy tern (EPBC Act listing as vulnerable):
  - Breeding grounds are located on offshore islands in the Gascoyne and Pilbara with breeding occurring late July to September.
- Lesser crested tern (EPBC Act listing as migratory):
  - Breeding occurs around offshore islands in Gascoyne, Pilbara and Kimberley in March to June.
- Roseate tern (EPBC Act listing as migratory):
  - Breeding grounds occurs around offshore islands in Gascoyne, Pilbara and Kimberly during mid-March to July.
- Wedge-tailed shearwater (EPBC Act listing as migratory):
  - Breeding for occurs in inshore islands around Montebello Islands between mid-August to April (Pilbara).

The modelling predicted that the maximum distance for floating surface hydrocarbon exposure at the moderate threshold (10 g/m^2) from the source was predicted to be 473 km. The minimum time to shore at or above the moderate threshold as 3.25 days (78 hours) predicted at the Barrow Island and Montebello Islands shoreline cell, with the maximum total volume ashore was 2,565 m^3 for a specific shoreline (Barrow Island and Montebello Islands).

The minimum time to dissolved hydrocarbon exposure and entrained hydrocarbon exposure at the moderate and high threshold to any given receptor(s) was 38 hours and 21 hours, respectively, both at Montebello AMP.

Predicted impact:

Surface	In-water	Shoreline
Seabirds rafting, resting, diving or feeding within surface hydrocarbons may be exposed to surface hydrocarbons. Species most at risk include those that readily rest on the sea surface (such as shearwaters) and surface plunging species such as terns.	Seabirds could be impacted by in-water hydrocarbon exposure directly (i.e. whilst diving through the water column foraging) or indirectly (i.e. by consuming hydrocarbon-tainted fish, resulting in sub-lethal or toxic impacts).	Shorebird species foraging for invertebrates in intertidal feeding habitats, such as exposed sand and mud flats at lower tides, will be at potential risk of both direct impacts through contamination of individual birds (ingestion or soiling of feathers) and indirect impacts through the contamination of

Direct contact with hydrocarbons is likely to foul plumage, which may result in hypothermia due to a reduction in the ability of the bird to thermo-regulate and impaired waterproofing (ITOPF, 2011a). Increased heat loss as a result of a loss of water-proofing results in an increased metabolism of food reserves in the body, which is not countered by a corresponding increase in food intake and may lead to emaciation (DSEWPaC, 2011b). A bird suffering from cold, exhaustion and a loss of buoyancy (resulting from fouling of plumage) may dehydrate, drown or starve (ITOPF, 2011a; DSEWPaC, 2011b; AMSA, 2013). Physical smothering may also result in impaired navigation and flight performance (Hook et al., 2016). Toxic effects on birds may also result where the oil is ingested as the bird attempts to preen its feathers (ITOPF, 2011b). The preening process may also spread oil over otherwise clean areas of the body (ITOPF, 2011b). Whether this toxicity ultimately results in mortality will depend on the amount consumed and other factors relating to the health and sensitivity of the bird. In a review of 45 marine hydrocarbon spills, there was no correlation between the numbers of bird deaths and the volume of the spill (Burger, 1993).	As seabirds are top order predators, any impact on other marine life (e.g. pelagic fish) from hydrocarbon exposure may disrupt and limit food supply both for the maintenance of adults and the provisioning of young.	foraging areas that may result in a reduction in available prey items (Clarke, 2010). Any direct impact of oil on terrestrial habitats has the potential to contaminate seabirds present at the breeding sites (Clarke, 2010). Bird eggs may also be damaged if an oiled adult sits on the nest. Fresh crude was shown to be more toxic than weathered crude, which had a medial lethal dose of 21.3 mg/egg (Clarke, 2010). Studies of contamination of duck eggs by small quantities of crude oil, mimicking the effect of oil transfer by parent birds, have been shown to result in mortality of developing embryos (French-McCay, 2009). Shoreline accumulation will be concentrated along the high tide mark while the lower/upper parts are often untouched (IPIECA, 1995). As breeding activities of shorebirds and seabirds generally occurs above the high tide mark, exposure to hydrocarbons is considered unlikely to occur. However, oiled bird species may track oil into their nests, which may then have subsequent impacts on any eggs present.
Predicted impact summary:		
Impacts to rafting or foraging seabirds to hydrocarbons in the event of a LOWC is likely to occur given the extent of the Hydrocarbon Area and physical characteristics of the Wandoo Crude, as a persistent hydrocarbon, which may persist at the sea surface depending on the weather conditions (Section 5.15.2.1). However, given the transitory nature of foraging individuals and the absence of offshore aggregation areas in the Hydrocarbon Area, the presence of birds within the offshore environment at the time of the spill may be low.		

Breeding BIAs for several bird species intersect the Hydrocarbon Area at several offshore Pilbara islands within the Hydrocarbon Area, including the Montebello Islands which is a known nesting site for wedge-tailed shearwaters. Given the hydrocarbon characteristics of the Wandoo Crude, as a persistent heavy hydrocarbon, limited weathering is expected prior to shoreline impact, with the minimum time to shoreline accumulation predicted after ~3 days (Section 5.15.2.1).

There is the potential for indirect impacts to seabirds in offshore waters as a result of hydrocarbon exposure, such as reduced prey abundance

Consequently, due to the volume predicted to accumulate on the shorelines, expected time to impact, the potential consequence to seabird and shorebirds is limited to impacts to individual species of recognized conservation value, including those undertaking foraging and breeding activities, however, only short-term impacts at a population level is expected. As such, a consequence ranking of '2' (Minor) was assigned.

Fish, sharks and rays

Exposure evaluation:

Various fish and shark species were identified by the EPBC Protected Matters Search for the Hydrocarbon Area (Section 3.4.3.4).

A foraging BIA for the whale shark was identified within the Hydrocarbon Area (Section 3.4.4).

Any pelagic fish and shark species that occupy the water column, specifically within the upper 0 – 10 m of the water column the surface layers of the water column (where in-water hydrocarbon exposure is predicted), are more susceptible to entrained and dissolved hydrocarbons. Since fish, sharks, and rays do not generally break the sea surface, the impacts of surface hydrocarbons to fish and shark species are unlikely to occur. Near the sea surface, fish are able to detect and avoid contact with surface slicks meaning fish mortalities rarely occur in the event of a hydrocarbon spill in open waters (Volkman et al., 1994).

There may be demersal species may be susceptible to oiled sediments, particularly species that are site restricted.

The maximum distance for dissolved hydrocarbons the moderate exposure threshold was predicted to be 425 km, and 1,037 km for entrained thresholds at the high threshold (5.15.2.1).

Predicted impact:

In-water

Fish, sharks, and rays can be exposed to in-water hydrocarbon droplets through a variety of pathways, including:

- Direct dermal contact (e.g. whilst swimming through oil or waters with elevated dissolved hydrocarbon concentrations and other constituents, with diffusion across their gills (Hook et al., 2016))
- Ingestion (e.g. directly or via food base, fish that have recently ingested contaminated prey may themselves be a source of contamination for their predators)
- Inhalation (e.g. elevated dissolved contaminant concentrations in water passing over the gills).

Many fish species can metabolise toxic hydrocarbons, which reduces the risk of bioaccumulation of contaminants in the food web (and human exposure to contaminants through the consumption of seafood) (NRDA, 2012). Fish exposed to aromatics in the water have been shown to have a reduced aerobic capacity, which may be a result of the process to eliminate ingested oil from the fish (Cohen et al., 2005).

A Foraging BIA for the whale shark intersects the Hydrocarbon Area . Whale sharks are suction filter feeders and are known to congregate in Ningaloo during March to July to feed on the seasonal concentrations of krill and other zooplankton which occur during coral spawning events. The whale shark is generally encountered close to or at the surface spending 40% of their time in the upper 15 m of the water column and 50% of time at depths equal to or less than 30 m. Hydrocarbon spills may pose a threat to whale sharks (DoE, 2024a).

However, generally these species are highly mobile species, and their patterns of movements makes it unlikely for them to remain within the area long enough to be exposed to hydrocarbons to experience sub-lethal impacts (ITOPF, 2011b). Pelagic species fish are able to detect and avoid contact with surface slicks meaning fish mortalities rarely occur in the event of a hydrocarbon spill in open waters (Volkman et al., 1994). As a result, wide-ranging pelagic fish of the open ocean generally are not highly susceptible to impacts from surface hydrocarbons.

Adult fish kills reported after oil spills, occur mainly to shallow water, near-shore benthic species (Volkman et al., 1994), including areas such as reefs and other seabed features where species are less likely to move away into open waters (i.e. site-attached species).

Fish are most vulnerable to hydrocarbons during their embryonic, larval and juvenile life stages (Fodrie and Heck, 2011; Hjermann et al., 2007).

Recovery of fish assemblages depends on the intensity and duration of an unplanned discharge, the composition of the discharge and whether dispersants are used, as each of these factors influences the level of exposure to potential toxicants. Recovery would also depend on the life cycle attributes of fishes. Species that are abundant, short-lived and highly fecund may recover rapidly. However less abundant, long-lived species may take longer to recover. The range of movement of fishes will also influence recovery. The nature of the receiving environment would influence the level of impact on fishes.

Recovery of fish assemblages depends on the intensity and duration of an unplanned discharge, the composition of the discharge and whether dispersants are used, as each of these factors influences the level of exposure to potential toxicants. Recovery would also depend on the life cycle attributes of fishes. Species that are abundant, short-lived and highly fecund may recover rapidly. However less abundant, long-lived species may take longer to recover. The range of movement of fishes will also influence recovery. The nature of the receiving environment would influence the level of impact on fishes.

Predicted impact summary:

As identified in Section 3.4.3.4, a number of fish and shark species, including the whale shark may occur in the Hydrocarbon Area. Impacts are mostly expected for fish in their embryonic, larval and juvenile life stages, which could lead to impacts to some component, or all of a year class, given that most species have seasonal pulsed recruitment, of a fish species being impacted. Indirect impacts, such as a reduction or contamination of food sources, may also occur.

However, given the wide distribution of fish species in the region, and the wide-spread foraging area typical of fish species, such as whale sharks, impacts to an entire population or population's overall viability is not anticipated. As such, any impacts to fish and shark populations from exposure to hydrocarbons following a LOWC are anticipated to be reversible, short-term, and not expected to affect species population functioning or general ecosystem functioning. As such, a consequence ranking of '2' (Minor) was assigned.

Marine mammals

Exposure evaluation:

Several marine mammal species were identified by the EPBC Protected Matters Search for the Hydrocarbon Area (Section 3.4.3.5) including:

- Sei whale (EPBC Act listing as vulnerable)

- Blue whale (EPBC Act Listing as endangered)
- Fin whale (EPBC Act listing as vulnerable)
- Southern right whale (EPBC Act listing as endangered).

A Migration BIA for the humpback whale intersects the Hydrocarbon Area. The humpback whale migration corridor extends along the WA coast out to ~50 – 100 km from the coast. Migration occurs between May and late November.

The maximum distance for dissolved hydrocarbons the moderate exposure threshold was predicted to be 425 km, and 1,037 km for entrained thresholds at the high threshold (5.15.2.1). The modelling predicted that the maximum distance for floating surface hydrocarbon exposure at the moderate threshold (10 g/m^2) from the source was predicted to be 473 km.

Predicted impact:

Surface	**In-water**
Marine mammals may come into contact with surface hydrocarbons when surfacing. However, direct surface oil contact with hydrocarbons is considered to have little deleterious effect on marine mammals, and any effect is likely to be minor and temporary. This may be due to the skin's effectiveness as a barrier to toxicity (Geraci and St Aubin, 1988). Cetaceans have mostly smooth skins with limited areas of pelage (hair covered skin) or rough surfaces such as barnacled skin. Oil tends to adhere to rough surfaces, hair or calluses of animals, so contact with hydrocarbons by cetaceans is expected to cause only minor hydrocarbon adherence. The susceptibility to ingested hydrocarbon has also been shown to vary with feeding habits. Baleen whales (such as blue, southern right and humpback whales) are not particularly susceptible to ingestion of oil in the water column but are susceptible to oil at the sea surface as they feed by skimming the surface. Oil may stick to the baleen while they 'filter feed' near slicks. Sticky, tar-like residues are particularly likely to foul the baleen plates. Habitat modification is identified as threats for the blue whale, southern right whale, and dugong. Activities within this EP will not be inconsistent with the conservation and management priorities outlined in these Conservation Management Plans.	Chronic toxicity effects have the potential to occur in the event of prolonged and continuous exposure (e.g. >96 hours) to high concentrations of hydrocarbons in the water column (NRC, 2001). Cetaceans exposed to entrained hydrocarbons can result in physical coating as well as ingestion (Geraci and St Aubin, 1988). Such impacts are associated with 'fresh' hydrocarbon, the risk of impact declines rapidly as the hydrocarbon weathers. The susceptibility to ingested hydrocarbon has also been shown to vary with feeding habits. Specifically, toothed whales and dolphins may be susceptible to ingestion of dissolved and entrained oil as they gulp feed at depth. There are reports of declines in the health of individual pods of killer whales (a toothed whale species), though not the population as a whole, in Prince William Sound after the Exxon Valdez vessel spill (heavy oil) (Hook et al., 2016). Geraci (1988) found little evidence of cetacean mortality from hydrocarbon spills; however, some behaviour disturbance (including avoidance of the area) may occur. Pelagic species have been said to avoid hydrocarbon, mainly because of its noxious odours, but this has not been proven. In the event that avoidance were to occur, the potential for physiological impacts from contact with hydrocarbons would be reduced, however, active avoidance of an area may disrupt behaviours such as migration, or displace individuals from important habitat, such as foraging, resting or breeding. Although, the strong attraction to specific areas for breeding or feeding (e.g. the breeding, calving and nursing grounds within the North-West Cape region for the

	dugong) may override any tendency for marine mammals to avoid the noxious presence of hydrocarbons. Dolphin populations from Barataria Bay, Louisiana, USA, which were exposed to prolonged and continuous oiling from the Macondo oil spill in 2010, had higher incidences of lung and kidney disease than those in the other urbanised environments (Hook et al., 2016). The spill may have also contributed to unusually high perinatal mortality in bottlenose dolphins (Hook et al., 2016).
Predicted impact summary:	
The potential for environmental impacts would need to coincide with a migration or aggregation event to result in exposure to a large number of individuals. A proportion of a migrating population of cetaceans could be affected for a single migration event, which could result in temporary and localised consequences. However, given the wide distribution of marine mammal species in the region and the nature of the potential impacts, impacts to an entire population or the population's overall viability is not anticipated. Any impacts to marine mammals from exposure to hydrocarbons following a LOWC are anticipated to be reversible, short-term, and not expected to affect species population functioning or general ecosystem functioning. As such, a consequence ranking of '2' (Minor) was assigned.	
Marine reptiles	
Exposure evaluation:	
Marine reptiles may be exposed to hydrocarbon when transiting through the in-water hydrocarbons, surfacing to breathe within the surface slick, or nesting on oiled shorelines. BIAs and habitat critical for the survival of marine turtles for 4 species of marine turtles intersect the Hydrocarbon Area (Section 3.4.3.6 and Section 3.4.4), including: • Flatback turtle (EPBC Act listed as vulnerable) • Green turtle (EPBC Act listed as vulnerable) • Hawksbill turtle (EPBC Act listed as vulnerable) • Loggerhead turtles (EPBC Act listed as endangered). Turtle nesting and internesting areas and rookeries for sea turtles in the Hydrocarbon Area, including the Montebello islands. The Recovery Plan for Marine Turtles in Australia: 2017–2027 (CoA, 2017) highlights acute chemical discharge as one of several threats to marine turtles. EPBC Act listed sea snakes that are found within the Hydrocarbon Area include: • Short-nosed sea snake (EPBC Act listed as critically endangered) • Leaf-scaled sea snake (EPBC Act listed as critically endangered) • Dubois' sea snake (EPBC Act listed as marine).	

There may be sea snakes present in the area predicted to be exposed to surface hydrocarbon within the Hydrocarbon Area ; however, their presence is expected to be of a transitory nature only, and most species are not pelagic and therefore unlikely to be in high numbers within the Hydrocarbon Area.

The spill modelling identified that the highest probability of hydrocarbon accumulation on a specific shoreline at or above the moderate threshold (100 g/m^2) was 88% at the Barrow Island and Montebello Islands shoreline cell. The minimum time to shore was 3.25 days (78 hours) and the maximum total volume of hydrocarbon ashore for a single spill trajectory was 2,565 m^3 (Section 5.14.2.1). Montebello Island also recorded the maximum length of hydrocarbon ashore above the moderate threshold (59 km).

The maximum distance for dissolved hydrocarbons the moderate exposure threshold was predicted to be 425 km, and 1,037 km for entrained thresholds at the high threshold (Section 5.15.2.1). The modelling predicted that the maximum distance for floating surface hydrocarbon exposure at the moderate threshold (10 g/m^2) from the source was predicted to be 473 km.

Predicted impact:

Surface	In-water	Shoreline
<u>Marine turtles</u> Ingested oil may cause harm to the internal organs of turtles. Visibly oiled turtles showed higher indicators of PAH in tissues, stomach content, colon content and faeces compared to non-visibly oiled turtles (Ylitalo et al., 2017). This exposure pathway may cause an increase in the production of white blood cells and may affect the functioning of their salt gland (Lutcavage et al., 1995). Oiling has the potential to cause mortality depending on the size of the individual and the extent of oiling (DWH Natural Resource Damage Assessment Trustees, 2016). <u>Sea snakes</u> Foraging behaviours which occur near the water surface may increase the vulnerability of individuals to hydrocarbon exposure (Yaghmour et al., 2022).	Some individual marine reptiles may come into contact with in-water hydrocarbon exposure while swimming or feeding. <u>Marine turtles</u> Entrained hydrocarbons can adhere to body surfaces (Gagnon and Rawson, 2010) and can enter cavities such as the eyes, nostrils, or mouth. This can cause an elevated susceptibility to infections (NOAA, 2010b). Records of oiled wildlife during spills rarely include marine turtles, even from areas where they are known to be relatively abundant (Short, 2011). An exception to this was the large number of marine turtles collected (613 dead and 536 live) during the Macondo spill in the Gulf of Mexico, although many of these animals did not show any sign of oil exposure (NOAA, 2021). Of the dead turtles found, 3.4% were visibly oiled and 85% of the live turtles found were oiled (NOAA, 2021). Of the captured animals, 88% were later released, suggesting that oiling does not inevitably lead to mortality. <u>Sea snakes</u> Sea snakes have the potential to be directly and indirectly impacted by hydrocarbons. In general, there is limited	Marine turtles may experience oiling impacts on nesting beaches when they come ashore to lay their eggs. There is potential for contamination of turtle eggs to result in toxic impacts, such as developmental defects in hatchlings, to developing embryos. Turtle hatchlings may be more vulnerable to smothering as they emerge from the nests and make their way over the intertidal area to the open water (AMSA, 2015). Hatchlings that contact oil residues while crossing a beach can exhibit a range of effects including impaired movement and bodily functions (Shigenaka, 2003). Hatchlings sticky with oily residues may also have more difficulty crawling and swimming, rendering them more vulnerable to predation. Marine pollution is listed as a threat to marine turtle in the Recovery Plan for Marine Turtles in Australia, 2017 – 2027, particularly in relation to shoreline oiling of nesting beaches.

	literature on the impacts of oil spills to sea snakes. A recent study by Yaghmour et al. (2022) is the only study to record lethal impacts to sea snakes following a crude oil spill in the Gulf of Oman. The study identified varying levels of smothering, including over their eyes, snout, mouth, and oesophagus. The number of sea snakes that may be exposed is expected to be low due to the offshore location and the lack of BIAs. Therefore, potential impact would be limited to individuals, with population impacts not anticipated.	

Predicted impact summary:

Due to the low number of sea snakes anticipated within the Hydrocarbon Area, impacts to sea snakes at both an individual or population level is not anticipated.

Given the hydrocarbon characteristics of the Wandoo Crude, as a persistent heavy hydrocarbon, limited weathering is expected prior to shoreline impact, with the minimum time to shoreline accumulation predicted after ~3 days (Section 5.15.2.1). Shoreline accumulation at nesting beaches within the Hydrocarbon Area has the potential to cause impacts to nesting females and hatchlings. Impacts to individuals transiting through the area may also occur when individual surface to breed, or forage. Considering the wide distribution of marine reptile species in the region and the nature of the potential impacts, impacts to an entire population or the population's overall viability is, however, not anticipated.

Consequently, due to the volume predicted to accumulate on the shorelines, expected time to impact, the potential consequence to marine reptile is limited to impacts to individual species of recognized conservation value, including those undertaking foraging and breeding activities, however, only short-term impacts at a population level is expected. As such, a consequence ranking of '2' (Minor) was assigned.

Protected and Significant Areas

Protected and significant areas have been assessed based on the hydrocarbon exposure based on the thresholds that have the potential to cause ecological impacts (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using moderate hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved) and the high hydrocarbon exposure for in-water (entrained) hydrocarbons. This is defined as the Hydrocarbon Area.

Table 5-72 evaluates the potential impact that hydrocarbon spills for this activity may have on protected and significant areas receptors found within the Hydrocarbon Area.

Table 5-72: Risk assessment for an accidental LOWC of Wandoo Crude – protected and significant areas

Marine parks
Exposure evaluation:
There are six Australian Marine Parks (AMPs) which intersect the Hydrocarbon Area (Table 3-12): • Abrolhos AMP • Dampier AMP • Gascoyne AMP • Montebello AMP • Ningaloo AMP • Shark Bay AMP. One State Marine Park was also identified to intersects the Hydrocarbon Area (Table 3-13): • Montebello Islands and Barrow Islands (Jointly Managed) • Ningaloo and Murion Islands Marine Management area (Jointly Managed) • Pilbara Islands Nature Reserve (Great Sandy Island, Little Rocky Island, Thevenard Island, Unnamed WA51046). The major conservation values for AMPs and State Marine Parks have been identified in Section 3.6.4 and Section 3.6.5, respectively. In general the AMPs include examples of unique ecosystems with characteristics that support diverse benthic or intertidal habitats, and often a range of species listed under the EPBC Act, often including BIAs, such as breeding and foraging habitat for seabirds, internesting, foraging, mating, and nesting habitat for marine turtles, breeding, calving, foraging and nursing habitat for dugongs, foraging habitats, and migratory pathway for certain marine species, such as humpback whales, pygmy blue whales, whale sharks. Mangrove thickens are found on some of the Montebello Islands and Barrow Islands which provide essential habitat for coastal species and shorebirds (Section 3.4.2.1). Sea Country which overlaps these AMPs and MPs is valued for Indigenous cultural identity, health and wellbeing. These AMPs and MPs and associated receptors may be impacted by exposure to surface, in-water, and shoreline hydrocarbons. The minimum time to dissolved hydrocarbon exposure at the moderate 50 ppb threshold at any given receptor(s) was 38 hours at the Montebello AMP, which also recorded the highest probability of intersect with at 7%. The highest probability of entrained hydrocarbons at the high 100 ppb threshold for Montebello AMP was 96% with contact predicted in 21 hours (RPS, 2024). The in-water probability results for the other AMPs to be intersected by these threshold levels included: • 43% entrained and 1% for dissolved at Gascoyne AMP • 15% entrained and 1% for dissolved at Dampier AMP • 1% entrained and no contact for dissolved at Abrolhos AMP

The in-water probability results for the other MPs to be intersected by these threshold levels included:

- 78% entrained and 1% for dissolved at Montebello Islands and Barrow Islands MP
- 47% entrained and no contact for dissolved at Ningaloo and Murion Islands MP.
- 37% entrained and no contact for dissolved at Pilbara Islands Nature Reserve MP.

The spill modelling identified that the highest probability of hydrocarbon accumulation on a specific shoreline at or above the moderate threshold (100 g/m^2) was 88% at the Barrow Island and Montebello Islands shoreline cell, which is a considered a part of the Pilbara Islands Nature Reserve MP. The minimum time to shore was 3.25 days (78 hours) and the maximum total volume of hydrocarbon ashore for a single spill trajectory was 2,565 m^3 (Section 5.14.2.1). Montebello Island also recorded the maximum length of hydrocarbon ashore above the moderate threshold (59 km). The shoreline results for the other AMPs and MPs intersected by this threshold level included:

- 33% at the shoreline component of the Ningaloo AMP and Ningaloo and Murion Islands MP
- 2% at the shoreline component of the Shark Bay AMP.

Predicted impact:

Surface	In-water	Shoreline
The values identified within the Protected Areas have the potential to be exposed to surface hydrocarbons at, or above, the low threshold, in the event of a spill incident. Impact to these receptors from direct or indirect exposure to surface hydrocarbons may cause a subsequent negative impact to the value of the Protected Areas. Refer also to: • Fish, sharks and rays • Seabirds and shorebirds • Marine reptiles • Marine mammals • Tourism.	The values identified within these Protected Areas have the potential to be exposed to entrained hydrocarbons at, or above, the moderate threshold in the event of a spill incident. Impact to these receptors from direct or indirect exposure to in-water hydrocarbons may cause a subsequent negative impact to the value of the AMP and State MPs. Refer also to: • Plankton • Coastal communities • Benthic invertebrates • Seabirds and shorebirds • Fish, sharks and rays • Marine reptiles • Marine mammals.	Hydrocarbons can become concentrated as it strands ashore. However, most of the oil is concentrated along the high tide mark while the lower/upper parts are often untouched (IPIECA, 1995). Impact to these receptors from direct or indirect exposure to shoreline hydrocarbons may cause a subsequent negative impact to the value of the State Protected Areas or the nearshore component adjacent to the AMP. Refer also to: • Benthic habitats • Coastal communities • Benthic invertebrates • Seabirds and shorebirds • Marine reptiles.

Predicted impact summary:
Impacts to the value and associated sensitives of marine parks may occur given the extent of the Hydrocarbon Area and physical characteristics of the Wandoo Crude, as a persistent hydrocarbon, which is predicted to remain either floating at the sea surface, or persist as entrained droplets within the water column, depending on the weather conditions (Section 5.15.2.1), until it slowly decays or degrade over time following the release into the marine environment. Given the credible release duration (up to a maximum of 35 days), the potential consequence to the sensitive receptors of the AMPs and MPs, the oil spill response activities that would be implemented in the event of a LOWC (Section 5.16), and the typically dispersive environment of the offshore environment, majority of the potential consequences to AMPs and State MPs will be reversible, short-term impacts on habitats and species of recognised conservation value or to local ecosystem functioning. However given the presence of highly sensitive habitats, such as mangroves communities present on some of the islands within the State MPs, and the potential recovery rates of mangroves to persistent hydrocarbons, such as Wandoo Crude, the potential consequence to MPs has been conservatively assessed as persistent but reversible, long-term impacts, to species or habitats of recognized conservation value or to local ecosystem function. As such, a consequence ranking of '4' (Major) was assigned.
Wetlands of international importance
Exposure evaluation:
Eighty-mile Beach is a 220 km section of coastline and adjacent intertidal mudflats located within the Hydrocarbon Area, between Port Headland and Broome, 346 km east of the Operational Area. The Ramsar site and is made up of Eighty-mile Beach and 40 km to the east, Mandora Salt Marsh, which includes two large seasonal wetlands and a series of small permanent mound springs (DPAW, 2014). The Eighty-mile Beach Ramsar wetland supports the EPBC listed flatback turtle and is also considered one of the most important sites for stop-over and feeding by migratory shorebirds in Australia. The hydrocarbon spill modelling report predicted a low probability of hydrocarbon accumulation at or above the moderate entrained threshold (100 g/m^2) for Eighty Mile Beach (1-11%), with minimum time to shore predicted as ~31 days (>746 hours) (RPS, 2024). No contact for dissolved in-water hydrocarbons was predicted.
Predicted impact:
Shoreline
Internationally important wetlands, such as the Eighty-mile Beach Ramsar wetland, including associated saline marsh areas and estuarine environments, can typically be impacted by hydrocarbons as they are often a continuity from the sea. Therefore, depending on where the shoreline contact occurs there is a potential for shoreline oil to move into the estuary and wetlands, potentially impacting the aesthetic and ecological value of the wetland. Wetland environments are considered to have a high sensitivity to hydrocarbon exposure. The vegetation found in wetlands, are similar to saltmarshes and other estuarine plants, typically have a large surface area for oil absorption and their structure traps oil. The degree of impact of oil on wetland vegetation are variable and complex, and can be both acute and chronic, ranging from short-term disruption of plant functioning to mortality. Refer also to: • Seabirds and shorebirds

- Marine reptiles
- Saltmarsh
- Intertidal mudflats.

Predicted impact summary:

Impacts to internationally important wetlands may occur given the extent of the Hydrocarbon Area and physical characteristics of the Wandoo Crude, as a persistent hydrocarbon, where limited weathering is expected prior to shoreline impact, with the minimum time to shoreline accumulation predicted after ~31 days (RPS, 2024).

To account for the sensitivity of wetlands to hydrocarbons, the potential consequence to wetland habitats (Eighty-mile Beach Ramsar wetland) has been assessed conservatively, on the potential for localised, medium-term impacts, to species or habitats of recognized conservation value or to local ecosystem function. As such, a consequence ranking of '3' (Moderate) was assigned.

Key Ecological Features

Exposure evaluation:

The Hydrocarbon Area intersects various KEFs as described in Table 3-14. These include:

- Ancient coastline at 125 m depth contour
- Canyons linking the Argo Abyssal Plain with the Scott Plateau
- Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula
- Commonwealth water adjacent to Ningaloo Reef
- Continental slope demersal fish communities
- Exmouth Plateau
- Glomar Shoals
- Western demersal slope and associated fish communities.

The conservation values for these KEFs have been described in Section 3.6.7 and may include unique seafloor environments, and sensitive reefs and shoals that are considered to be of regional importance for a region's biodiversity or ecosystem function and integrity. Some of the KEFs, such as the Glomar shoals, are areas of high productivity and aggregations of marine life and known to be an important area for a number of commercial and recreational fish species and consist of a high percentage of marine-derived sediments with high carbonate content and gravels of weathered coralline algae and shells (DCCEEW, 2024j).

The highest probability of entrained hydrocarbons at the high 100 ppb threshold for Glomar Shoals KEF (61%) with contact predicted in 94 hours (RPS, 2024). The minimum time to dissolved hydrocarbon exposure at the moderate 50 ppb threshold at any given receptor(s) was 197 hours (~8 days) at the Glomar Shoals KEF, which also recorded the highest probability of intersect with at 3%.

The in-water probability results for the other KEFs to be intersected by these threshold levels included:

- 54% entrained and 2% for dissolved at Ancient coastline at 125 m depth contour KEF
- 50% entrained and 1% for dissolved at Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula KEF
- 47% entrained and 2% for dissolved at Commonwealth water adjacent to Ningaloo Reef
- 46% entrained and 1% for dissolved at Continental slope demersal fish communities KEF
- 44% entrained and no contact for dissolved at Canyons linking the Argo Abyssal Plain with the Scott Plateau KEF
- 12% entrained and no contact for dissolved at Exmouth Plateau KEF
- 1% entrained and no contact for dissolved at Western demersal slope and associated fish communities KEF.

Predicted Impact:

Surface	**In-water**
The values identified within the KEFs are identified for their unique seafloor features with ecological properties of regional significance, which apply to both the benthic and pelagic habitats. Features include nutrient upwellings and hard substrates supporting sponges, corals, and other benthic invertebrates which support a diversity of species including threatened and migratory EPBC Act listed fauna including whales, whale sharks, marine turtles, sea snakes, and seabirds. These areas have the potential to be exposed to surface hydrocarbons at, or above, the low threshold, in the event of a spill incident. Impact to these receptors from direct or indirect exposure to surface hydrocarbons may cause a subsequent negative impact to the value of the KEFs. Refer to: • Fish sharks, and rays • Seabirds and shorebirds • Marine reptiles • Marine mammals.	The values identified within these KEFs have the potential to be exposed to entrained hydrocarbons at, or above, the low threshold. However, the exposure of entrained hydrocarbons will be greatest within the upper 10 m of the water column and areas close to the spill source. Therefore, the spill is unlikely to intersect with majority of the seafloor values of the KEFs which are concentrated within the water column >10 m deep or along the seafloor at varying water depths. Hydrocarbon exposure to the key receptors of the KEFs (e.g. seabirds, pinnipeds and cetaceans) may cause a subsequent negative impact to the value of the KEFs, however is expected to be limited to a small number of individuals, with no impacts to regional populations. Refer to: • Benthic habitats • Plankton • Fish, sharks, and rays • Seabirds and shorebirds • Marine reptiles • Marine mammals.

Predicted impact summary:
Impacts to the value and associated sensitives of KEFs may occur given the extent of the Hydrocarbon Area and physical characteristics of the Wandoo Crude, as a persistent hydrocarbon, which is predicted to remain either floating at the sea surface, or persist as entrained droplets within the water column, depending on the weather conditions (Section 5.15.2.1), until it slowly decays or degrade over time following the release into the marine environment. Given the credible release duration (up to a maximum of 35 days), the potential consequence to the sensitive receptors of the KEFs, and the oil spill response activities that would be implemented in the event of a LOWC (Section 5.16), and the typically dispersive environment of the offshore environment, the potential consequences to KEFs will be reversible, short-term impacts on habitats and species of recognised conservation value or to local ecosystem functioning. As such, a consequence ranking of '2' (Minor) was assigned.

Other Marine Users

Other marine users, such as social and economic receptors, have been assessed based on the hydrocarbon exposure based on the thresholds that have the potential to cause socio-economic effects (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using low hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved and entrained) hydrocarbons. This is defined as the EMBA .

Table 5-73 evaluates the potential impact that hydrocarbon spills for this activity may have on social and economic receptors found within the EMBA .

Table 5-73: Risk assessment for an accidental LOWC of Wandoo Crude – other marine users

Commercial fisheries
Exposure evaluation:
Several Commonwealth and State-managed fisheries were identified to have management areas that intersect the EMBA (see 3.5.1). The maximum distance for dissolved and entrained hydrocarbons at the low threshold was predicted to be 790 km and 1,302 km, respectively (RPS, 2024). The fisheries that have the potential to interact with the EMBA include 5 Commonwealth Fisheries. However, of these fisheries only 1 fishery has recorded active fishing based on historical datasets and have the potential to interact with the EMBA: • North West Slope Trawl Fishery. 33 WA State Fisheries intersect the EMBA (Section 3.5.1). However, of these fisheries, only 28 fisheries have recorded active fishing in the EMBA between 2018 – 2023 and have potential to interact with the EMBA, including: • Abrolhos Islands and Mid West Trawl Managed Fishery • Broome Prawn Managed Fishery • Exmouth Gulf Beach Seine and Mesh Net Managed Fishery • Exmouth Gulf Prawn Managed Fishery • FBL Condition 74 Fish Trapping • Gascoyne Dermersal Scalefish Managed Fishery • Hermit Crab Fishery • Mackerel Managed Fishery • Marine Aquarium Fish Managed Fishery • Nickol Bay Prawn Fishery • Northern Demersal Scalefish Managed Fishery • Onslow Prawn Limited Entry Fishery • Open Access (North Coast, Gascoyne Coast and West Coast Bioregions) • Pearl Oyster Managed Fishery • Pilbara Crab Managed Fishery • Pilbara Line Fishery (Condition)*

- Pilbara Fish Trawl Interim Managed Fishery
- Pilbara Trap Managed Fishery
- Shark Bay Prawn Managed Fishery
- Shark Bay Scallop Limited Entry Fishery
- Specimen Shell Managed Fishery
- Tour Operator
- West Coast Deep Sea Crustacean Managed Fishery
- West Coast Demersal Gillnet and Demersal Longline Interim Managed Fishery
- West Coast Demersal Scalefish (Interim) Managed Fishery
- West Coast Rock Lobster Managed Fishery
- Western Australian Sea Cucumber Fishery.

Refer to Section 3.5.1 for a further description on fisheries that intersect the EMBA .

Predicted impact:

Surface	**In-water**
Physical displacement of commercial fishers may occur due to the establishment of exclusion zones during the spill response. Visible surface hydrocarbons (i.e. a slick) may have the potential to cause impact public perception of the industry, potentially causing a negative economic impact. Refer to: • Fish, sharks, and rays.	As discussed in the relevant sections above (i.e. fish and invertebrates) exposure to in-water hydrocarbons has the potential to impacts species. Due to the sensitivity, a small number of juvenile fish, larvae, and planktonic organisms, may be impacted. This could lead to some component, or all of a year class, given that most species have seasonal pulsed recruitment, of commercially targeted marine species (i.e. fish and invertebrate species) to be impacted. In-water hydrocarbon exposure may result in a reduction in commercially targeted marine species (i.e. fish and invertebrate species), subsequently resulting in impacts to commercial fishing productivity. Contamination of target species can cause economic impacts to the industry. Impacts to fisheries depends on a number of factors. Some studies following the impacts of the Deepwater Horizon oil spill in 2010 have shown negative impacts to individual fish, including changes in some fish populations, such as substantial declines to fish and invertebrate species since 2011 which have not yet recovered (Sutton et al.,

	2020). Whereas studies on other species, such as many commercially important shellfish species, showed fairly quick recovery after the spill (Gracia et al., 2020). Following a large spill the recovery of a population can happen within 10 years for species that reproduce quickly, compared to other slower growing populations, which may take over 30 years to recover (Ainsworth et al., 2018). The Deepwater Horizon spill significantly impacted Gulf fisheries. Impacts such as fishery closures, reduced catches, and economic losses, with some fisheries experiencing long-term effects. Most fishing areas reopened within a year or two; however, the last one in Louisiana reopened in 2015 (Ainsworth et al., 2018). Refer to: • Fish, sharks, and rays • Invertebrates.
Predicted impact summary:	
Acute impacts to commercially fished species may occur, however are expected to be limited to a small number of juvenile fish, larvae, and/or planktonic organisms. Depending on the timing of the spill, in the event that it overlaps with the timing of a species reproduction event (i.e. a spawning event), there is potential for localised impacts to population recruitment for commercially targeted species. However, due to the wide distribution of fish species typical in the region and the typical timing of recruitment events, impacts to an entire population, or population's overall viability is not anticipated. Given the hydrocarbon characteristics of the Wandoo Crude, as a persistent heavy hydrocarbon, limited weathering is expected. Furthermore potentially low to high levels entrainment rates were predicted, 0-93.9%, dependent on the weather conditions (Section 5.14.2.1). Therefore, any exclusion zones required to be established may cause impacts to the economic viability of the fishery, however impacts are expected to be limited to short-term exclusion from the area. As such, a consequence ranking of '2' (Minor) was assigned.	
Tourism and recreational fishing	
Exposure Evaluation:	
The Ningaloo region is a major tourism area that is overlapped by the EMBA. The Ningaloo region includes Ningaloo AMP, Ningaloo World Heritage Area, Ningaloo and Muiron Islands State MP, and Coral Bay and Exmouth communities. These areas are popular for a diverse range of marine-based tourism and recreational activities, such as: whale watching, recreational boating and fishing, charter fishing, snorkelling/diving, and surfing. Please see Section 3.5.4.1 for further details.	

Predicted impact:		
Surface	**In-Water**	**Shoreline**
Visible surface hydrocarbons (i.e. a slick) have the potential to reduce the visual amenity of the area for tourism and discourage recreational activities. Recreation is also linked to the presence of marine fauna and direct impacts to marine fauna such as whales, birds, and pinnipeds can result in indirect impacts to recreational values. A large spill may result in the temporary closure of a certain area or attraction, resulting in economic losses to the business are likely to eventuate. The extent of these losses would be dependent on how long the attraction remains closed. Refer also to: • Fish, sharks and rays • Seabirds and shorebirds • Marine mammals • Benthic invertebrates.	Any impact to receptors that are associated with marine-based tourism (e.g. whales, and whale sharks) may cause a subsequent negative impact to recreation and tourism businesses in the locally affected area. Recreational fishing over the area is popular. Precautionary exclusion from impacted areas following a hydrocarbon spill may be implemented until water quality monitoring verifies the absence of residual hydrocarbons. This could result in a temporary disruption to some recreational and tourism activities within and area for the duration of the response.	Visible hydrocarbons stranded on shorelines have the potential to reduce the visual amenity of the area for tourism and discourage recreational activities. Precautionary exclusion from shorelines may be implemented by local governments until water quality monitoring verifies the absence of residual hydrocarbons. This could cause disruption to some recreational and tourism activities within that area. Furthermore, visible hydrocarbons along shorelines may impact the aesthetic value for tourism and discourage recreational activities that may be operating within the area.
Predicted impact summary:		
Given the hydrocarbon characteristics of the Wandoo Crude, as a persistent heavy hydrocarbon, limited weathering is expected prior to shoreline impact, with the minimum time to shoreline accumulation predicted after ~3 days (Section 5.15.2.1). Due to the extent of the EMBA, the volume predicted to accumulate on the shorelines, and the high presence of recreational activities within the area, the potential consequence to tourism and recreational activities has been assessed conservatively, on the potential for short-term impacts. As such, a consequence ranking of '2' (Minor) was assigned.		

Additional other marine users	
Exposure Evaluation:	
Surface hydrocarbons may interact with additional other marine users, such as • Commercial shipping • Other oil and gas industry • Defence activities • Underwater heritage. The closest AMSA shipping fairway is 3 km south of the Operational Area, which indicates high shipping use within the area and the potential to interact with the EMBA (Section 3.5.2). Several other offshore oil and gas industries and pipelines are located within the EMBA (Section 3.5.4.2). The EMBA encompasses defence activities including an Exmouth naval communication station and several offshore training areas including the North West Exercise Area (NWXA) and Learmonth Air Weapons Range in the EMBA . These areas are used for Defence Force training exercises, including live firing (Section 3.5.3). There are 138 known historical shipwrecks located within the EMBA (3.6.3).	
Predicted impact:	
Surface	**In-water**
Physical displacement of other marine users may occur due to the establishment of exclusion zones during the spill response. However, due to the comparatively small area of exposure, and the fact that exclusion zones are not expected to be long-term, significant impacts are not anticipated.	In the event of a hydrocarbon spill, other marine users may be impacted by exclusion zones surrounding a spill. These users include: • Commercial shipping • Other oil and gas industry • Defence activities. Exclusion zones could reduce access for other marine users for the duration of the response undertaken for spill clean-up (if applicable) meaning vessels may have to take detours leading to potential delays and increased costs. <u>Underwater heritage</u> In general, in-water exposure is limited to the upper 0 – 10 m of the water column, and not within the deeper areas of the water column where underwater heritage is located. Therefore, impacts are not expected.

Predicted impact summary:
Given the hydrocarbon characteristics of the Wandoo Crude, as a persistent heavy hydrocarbon, limited weathering is expected (Section 5.15.2.1). Due to the extent of the EMBA, the volume predicted to be released, and the consequence of hydrocarbon spill on other marine users, the potential consequence to other marine users has been assessed as short-term impacts. As such, a consequence ranking of '2' (Minor) was assigned.

First Nations

First Nations values and sensitivities have been assessed based on the hydrocarbon exposure based on the most conservative thresholds that have the potential to cause socio-economic effects (Section 3.1.1). Therefore, the extent of the hydrocarbon exposure has been defined by using low hydrocarbon exposure thresholds for surface, shoreline and in-water (dissolved and entrained) hydrocarbons. This is defined as the EMBA.

Table 5-74 evaluates the potential impact that hydrocarbon spills for this activity may have on First Nations values and sensitivities found within the EMBA.

Table 5-74: Risk assessment for an accidental LOWC of Wandoo Crude – First Nations

First Nations heritage
Exposure evaluation:
The EMBA overlaps the following RATSIB Areas (Section 3.7): • Kimberley: Kimberley Land Council Aboriginal Corporation • Pilbara: Yamatji Marlpa Aboriginal Corporation • Gascoyne-Midwest: Yamatji Marlpa Aboriginal Corporation. The EMBA overlaps 9 Native Title Determinations (Table 3-15): • Nyangumarta-Karajarri Overlap Proceeding (Yawinya) • Nyangumarta People (Part A) • Ngarla and Ngarla #2 (Determination Area A) • Kariyarra • Ngarluma/Yindjibarndi • Yaburara & Mardudhunera People • Thalanyji • Gnulli, Gnulli #2 and Gnulli #3 - Yinggarda, Baiyungu and Thalanyji People • Ngarluma People. Table 3-15 provides further details of the location of each of these. The EMBA overlaps Indigenous Protected Areas (IPAs), which as areas of land and sea managed by Indigenous groups as protected areas for biodiversity conservation through voluntary agreements with the Australian Government (Section 3.7.4), including: • The Nyangumarta Warrarn IPA • The Tukujana pa Karajarri Kura Jurrar, Western Australia (Karajarri Traditional Lands Association) (Sea Country IPA) • Yamatji Sea Connection, Western Australia (Bundi Yamatji Aboriginal Corporation) (Sea Country IPA). First Nations people are intrinsically linked to Sea Country which encompasses lands, waterways, seas, cultural practices and values to which they are connected (AIATSIS, 2022). Country is a cultural landscape which includes both tangible values (i.e. cultural heritage sites) and intangible values (i.e. creation stories and cultural practices). First Nations cultural concepts are directly connected with Country. Country describes all aspects of place, environment, spirituality, law and identity. Values of Country differ between First Nations groups, and not all First Nations groups and communities in Australia hold the same belief systems or spirituality.

First Nations heritage		
Sea Country is Country that extends into the ocean. Smyth and Isherwood (2016) describe Sea Country as all estuaries, beaches, bays, and marine areas collectively, within a traditional estate. Sea Country contains evidence of the ancient mystical events by which all geographic features, animals, plants and people were created. Sea Country contains sacred sites and tracks (or 'Songlines') along which mythological beings travelled during the creation period (or 'Dreamtime') (Smyth and Isherwood, 2016). The sea, like the land, is integral to the identity of First Nations groups. Connection to Sea Country is accompanied by a complexity of cultural rights and responsibilities. Coastal areas traditionally were amongst the most densely populated areas due to the abundance of resources available. Formal recognition of Sea Country rights is significantly slower compared to land rights. This could be for a range of reasons including conflicting perspectives and opinions on traditional custodianship of land and how far it extends (Smyth and Isherwood, 2016). An unplanned hydrocarbon spill will impact the waters within Sea Country for a period while the spill disperses and weathers and has the potential to disrupt cultural values of Sea Country. The likelihood of a hydrocarbon spill occurring is assessed as highly unlikely and the actual area that may be affected from any single spill event would be considerably smaller than represented by the EMBA. The sea component of these areas may be contacted from surface, in-water, and shoreline hydrocarbon exposure. Hydrocarbon exposure may have the potential to impact the aesthetic and cultural values of Sea Country by the presence of physical hydrocarbons or the presence of oil spill responders.		
Predicted impact:		
Surface	**In-water**	**Shoreline**
Visible surface hydrocarbons have the potential to reduce the visual amenity of known culturally significant values identified within the marine environment, subsequently potentially impacting the value of the site to First Nations people. Refer also to: • Seabirds and shorebirds • Marine reptiles • Marine mammals.	First Nations people connection to Sea Country could potentially be impacted by exposure to hydrocarbons. See Section 3.7.6 for further details of the values. A number of animal totems in the form of stingrays, sharks, octopus, fish and birds were identified by Aboriginal Corporations (Table 3-16). In-water exposure at relevant thresholds may impact culturally important significant coastal habitats such as mangroves, and species to First Nations peoples, such as cetaceans, marine reptiles, and fish which may impact the cultural value of the species and cultural obligation to care for Country. The 10 ppb low entrained exposure threshold (used to define the extent of the EMBA) represents the very lowest concentration and corresponds generally with the lowest trigger levels for chronic exposure for entrained hydrocarbons in water quality guidelines, no ecological	Kariyarra Island (visible at low tide) was identified during consultation as having cultural significance to the Kariyarra people for intergenerational knowledge transfer and is a place of cultural importance (Table 3-16). Similarly, Wanparta Aboriginal Corporation identified islands of cultural value within their determination area that host Songlines (Table 3-16). Ngarluma and Murujuga Aboriginal Corporations identified cultural connection to the World Heritage-listed Dampier Archipelago, including Whim Creek and Delambre Island (Table 3-16). Visible hydrocarbons along a shoreline have the potential to reduce the visual amenity of known heritage sites along the coastline, subsequently potentially impacting the value of the site to First Nations people.

First Nations heritage		
	impacts are anticipated at this threshold. It is considered highly unlikely that there will be long-term impacts to First Nations activities from contact at the low entrained threshold. Refer also to: • Benthic habitats • Marine invertebrates • Mangroves • Marine mammals • Marine reptiles • Seabirds and shorebirds • Protected and significant areas.	Refer also to: • Coastal communities • Seabirds and shorebirds • Marine reptiles • Protected and significant areas.
Predicted impact summary:		
First Nations people's connection to Sea Country could potentially be impacted by exposure to hydrocarbons, given the extent of the EMBA and the physical characteristics of the Wandoo Crude, as a persistent hydrocarbon, which is predicted to remain either floating at the sea surface, or persist as entrained droplets within the water column, depending on the weather conditions (Section 5.15.2.1), until it slowly decays or degrade over time following the release into the marine environment. Impacts to the values of First Nations people such as a marine reptiles, shorebirds, and valuable coastal communities (i.e. mangroves), may occur given the extent of the EMBA and limited weathering expected prior to shoreline impact of Wandoo Crude, with the minimum time to shoreline accumulation predicted after ~3 days (Section 5.15.2.1). Given the credible release duration (up to a maximum of 35 days), the potential consequence to the sensitive receptors of First Nations people, the oil spill response activities that would be implemented in the event of a LOWC (Section 5.16), and the typically dispersive environment of the offshore environment, majority of the potential consequences to First Nations values will be reversible, short-term impacts on habitats and species of recognised conservation value or to local ecosystem functioning, and not widespread long-term impacts to Sea Country, ecosystem functions and integrity, or culturally significant species populations. However given the high sensitivity of certain values, such as mangrove communities and culturally significant offshore islands, to hydrocarbons and the associated potential recovery rates, the potential consequence to First Nations people has been assessed conservatively as reversible, long-term impacts, to species or habitats of recognized conservation value or to local ecosystem function. As such, a consequence ranking of '4' (Major) was assigned.		

5.15.4 Risk Ranking

The exploration drilling activities that will occur within the Operational Area has the potential to result in the accidental LOWC resulting in a release of hydrocarbons into the marine environment. Despite being considered potentially credible, a LOWC is identified as a worst-case spill scenario and the likelihood of it occurring is inherently very low.

The IOGP's Risk Assessment Data Directory Report No. 434 – 2 (IOGP, 2019) provides blowout frequency data based on blowout information from operations between 1980 and 2014 within the U.S, U.K and North Sea. This report stated that the likelihood of a blowout while drilling normal oil development wells in offshore operations carried out to North Sea standards, is 3.4 x 10^{-5}.

The use of OGP data is considered appropriate as it is drawn from spheres of operation that are carried out to a similar standard. VOGA's operations are carried out under the NOPSEMA regulatory regime which is similar to that applied in the offshore North Sea. It is therefore reasonable to assume that the standard of VOGA's operations will be similar to offshore North Sea standards.

The use of OGP data is conservative as:

- Oil wells have a lower blowout frequency; however, we have conservatively used the average of oil & gas wells from OGP which results in a slightly higher frequency than for oil wells alone.
- OGP data assumes that wells being drilled can flow to surface which is not true of all Wandoo wells drilled. Therefore, blowout frequency at Wandoo is likely to be lower than statistical data provided in OGP.
- A loss of secondary well control is possible, but unlikely, because of the controls applied during the planning and execution phases of VOGA's drilling operations.

Consequently, the total loss of well control during exploration drilling activities within Wandoo Field is considered to have an extremely low probability event with a frequency of 3.4 x 10^{-5}. This frequency results in a likelihood rating of Rare (A) in accordance with the VOGA risk assessment process (Section 4.6).

Given the nature and scale of the potential credible LOWC scenario and the associated consequence, impacts were anticipated to be predominantly localised, with short-medium term impacts to individuals or habitats, not affecting species populations. Due to the persistent nature of the Wando Crude, one long-term impacts, to species or habitats of recognized conservation value or to local ecosystem function, was identified. Therefore:

- The consequence ranking of '3' (Major) was assigned to mangroves, State MPs, and First Nations values, and a likelihood of 'A' (Rare) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).
- The consequence ranking of '3' (Moderate) was assigned to a change in water quality, internationally significant wetlands, protected and significant areas (excluding State MPs), and a likelihood of 'A' (Rare) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).

- The consequence ranking of '2' (Minor) was assigned to benthic habitats, marine fauna, protected and significant areas (excluding State MPs and wetlands), and other marine users, and a likelihood of 'A' (Rare) was considered appropriate, resulting in a risk ranking of 'Low' (RRIV).

5.15.5 ALARP Demonstration

Table 5-75: Demonstration of ALARP – Accidental release of LOWC

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-
Prevention			
Wells are designed in compliance with the VOGA Well Construction Standards Manual (WCSM) [VOG-5000-MN-003].	EPO-ED-10	Well design shall comply with standards described in VOGA's WCSM.	Statement in Basis of Well Design document.
VOGA standards require that casing and completion and wellhead components are manufactured to relevant API or ISO specifications.	EPO-ED-10	VOGA shall validate that well casing, completion and wellhead components are manufactured to relevant API specifications.	Purchase orders and contracts specify manufacturing standards.
VOGA selects contractors based on evaluation of their ability to provide fit-for-purpose services in support of an exploration campaign.	EPO-ED-10	The drilling exploration contractor used on a campaign shall be assessed through VOGA's contractor evaluation process or equivalent.	Records of contractor evaluation process.
VOGA standards require that all activities on a well after initial installation of a BOP require a minimum of two temporary barriers be in place unless exempted through a formal Management of Change (MoC) process.	EPO-ED-10	Drilling Program shall specify the barriers to be in place during well operations.	Drilling Program signed off by VOGA Well Construction Manager.
VOGA conduct Peer Review and Drill Well on Paper workshops to review well designs and operational plans.	EPO-ED-10	VOGA shall conduct Peer Review and Drill Well on Paper workshops to review well designs and operational plans.	Peer Review and Drill Well on Paper attendance records.

VOGA prepares a detailed program for each well activity to outline the intended work scope and the well barriers to be in place during the campaign.	EPO-ED-10	Drilling Program shall outline the intended work scope and well barriers to be in place during the campaign.	Drilling Program signed off by VOGA Well Construction Manager.
VOGA Drilling Supervisors, Completions Supervisors and Drilling Superintendents are required to hold current Well Control certification.	EPO-ED-10	VOGA Drilling Supervisors, Completions Supervisors and Drilling Superintendents shall hold current well control certification as required.	Drilling Superintendent confirms currency prior to operations commencing Certification records kept on file.
VOGA require the MODU Contractor to ensure that drilling personnel with a position of derrickman and above to hold well control certification.	EPO-ED-10	Relevant MODU personnel shall hold current well control certification as required.	Certification kept on file by MODU Contractor. Drilling Superintendent confirms currency prior to operations commencing.
VOGA require a Barrier Verification Document to be completed prior to progressing beyond programmed check points in a Drilling Program.	EPO-ED-10	VOGA Barrier Verification Document shall be completed and signed off by senior VOGA and Drilling Contractor representatives prior to progressing beyond the programmed check points in a Drilling Program.	Signed Barrier Verification Document.
VOGA require that BOPs are tested at regular intervals in accordance with API standard 53.	EPO-ED-10	VOGA shall validate that BOPs are tested at regular intervals in accordance with API standard 53 in accordance with VOGA requirements.	Tests noted in Daily Drilling Report.
Formation Integrity Tests (FITs) or Leak Off Tests (LOTs) are conducted after drilling out casing shoes or milling windows in existing casing if required under the WCSM.	EPO-ED-10	LOTs or FITs shall be conducted after drilling out casing shoes or milling windows in existing casing when programmed.	LOT or FIT report.
VOGA requires kick tolerances to be calculated for all pressure containing casing strings.	EPO-ED-10	Kick tolerance shall be calculated for all pressure containing casing strings in accordance with requirements of WCMS and Drilling Program.	Kick tolerance noted in Daily Drilling Report if kick tolerance calculations are required during drilling activities.

VOGA requires the Drilling Contractor and the mud logging service provider to independently monitor mud flows for variances.	EPO-ED-10	VOGA shall validate that the Drilling Contractor and the mud logging service provider monitor mud flows.	Daily mud reports.
VOGA require drilling contractor to conduct drills demonstrating preparedness to act if unexpected mud flows occur.	EPO-ED-10	VOGA shall validate that kick and choke drills conducted.	Drills noted in Daily Drilling Report.
Reduction			
None identified	-	-	-
Mitigation			
The NOPSEMA-accepted Source Control Emergency Response Plan (SCERP) will be implemented in the event of a LOWC.	EPO-ED-11	SCERP reviewed prior to exploration activities for any well capable of sustaining flow to surface. This includes an assessment of flow rate and duration using reservoir simulation modelling. If the assessment indicates potential for worst case discharge parameters to be exceeded, the MoC process will be undertaken in accordance with Section 8.5.	NOPSEMA-accepted SCERP. Review records. Reservoir modelling records. MoC records.
		Source control response strategies shall be implemented in accordance with the SCERP.	IAP records.
		Suitable rigs for relief well operations are identified at the time of reviewing the SCERP, and VOGA tracks MODU activity within the region and updates the register on monthly basis during drilling activities for any well capable of sustaining flow to surface.	Relief well rig availability register records.
The NOPSEMA-accepted Oil Pollution Emergency Plan (OPEP) will be implemented in the event of a LOWC.	EPO-ED-11	Oil spill response strategies shall be implemented in accordance with the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	IAP records.
The NOPSEMA-accepted Operational and Scientific Monitoring Plan (OSMP)	EPO-ED-11	Oil spill operational and scientific monitoring shall be implemented in accordance with the Exploration and Survey	IAP records.

will be implemented in the event of a LOWC.		Operations OPEP [AUPD24001-VOG-1100-YH-0016].	
Other			
None identified	-	-	-
Considered Control Measures	**Assessment of option**		**Decision**
None identified	-		
ALARP Summary: The impacts and potential risks from a LOWC are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-3), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). No reasonably practicable additional controls were identified that would further reduce the impacts without disproportionate sacrifice.			

5.15.6 Acceptability Demonstration

Table 5-76: Acceptability Demonstration – Accidental Release of LOWC

Acceptable level of impact/risk demonstrated	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-75).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy. Potential spills to be managed in accordance with Wandoo Emergency Response Plan [VOG-2000-RD-0017]/ Exploration and Survey Operations OPEP[AUPD24001-VOG-1100-YH-0016]/Exploration Operations SCERP.
Other requirements met	Yes – including: • Notice to Mariners issued via AMSA in a timely manner • Potential spills to be managed in accordance with SOPEP/SMPEP (equivalent to class) • Approved Conservation Advice for *Anous tenuirostris melanops* (Australian lesser noddy) (TSSC, 2015b) • Approved Conservation Advice for *Calidris canutus* (Red Knot) (DCCEEW, 2024b) • Approved Conservation Advice for *Calidris tenuirostris* (Great knot) (DCCEEW, 2024c) • Approved Conservation Advice for *Calidris ferruginea* (Curlew sandpiper) (DCCEEW, 2023a) • Approved Conservation Advice for *Papasula abbotti* (Abbott's booby) (TSSC, 2020a) • Conservation Advice for *Sternula albifrons* (little tern) (DCCEEW, 2025a) • Approved Conservation Advice for *Sternula nereis nereis* (fairy tern) (TSSC, 2011)

	• National Recovery Plan for Albatrosses and Petrels (2022) (DCCEEW, 2022) • Approved Conservation Advice for *Pristis zijsron* (green sawfish) (DEWHA, 2008b) • Approved Conservation Advice for *Pristis clavata* (dwarf sawfish) (DEWHA, 2009) • Sawfish and River Sharks Multispecies Recovery Plan: (*Pristis pristis, Pristis zijsron*, *Pristis clavata*, *Glyphis glyphis* and *Glyphis garricki*) (DoE, 2015) • Approved Conservation Advice for *Rhincodon typus* (whale shark) (TSSC, 2015c) • Recovery Plan for Marine Turtles in Australia, 2017-2027 (Commonwealth of Australia, 2017) • Approved Conservation Advice for *Dermochelys coriacea* (Leatherback Turtle) (DEWHA, 2008c) • Approved Conservation Advice for short-nosed sea snake (*Aipysurus apraefrontalis*) (DSEWPaC, 2011a).
RR < High (RRII)	Yes – Medium (RRIII).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-10 • EPO-ED-11 See Section 7 for further details.
Acceptability Summary: The impacts and potential risks of an accidental release of MDO have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-75), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

5.16 Unplanned: Environmental Impact of Oil Spill Response

5.16.1 Hazard report

Table 5-77: Hazard Report – Environmental Impacts of Oil Spill Response

HAZARD	Environmental Impacts of Oil Spill Response		
EP risk number	EP-ED-R16		
Activity/cause	Oil spill response activities		
Extent	Extent of the Hydrocarbon Area and EMBA – MDO and LOWC		
Potential impact description	Disturbance to benthic habitat, adjacent vegetation and other environmentally sensitive areas. Toxicity effects on marine fauna from dispersant. Disturbance to benthic habitat, adjacent vegetation and other environmentally sensitive areas. Scouring of sediments. Waste generation, disposal and management.		
IMPACT AND RISK EVALUATION SUMMARY			
Receptor	**Impact/Consequence**	**Likelihood**	**Residual Risk**
Water quality	Minor (2)	Unlikely (B)	Low (RRIV)

Benthic habitats	Incidental (1)	Unlikely (B)	Low (RRIV)
Coastal communities	Minor (2)	Unlikely (B)	Low (RRIV)
Marine fauna	Minor (2)	Unlikely (B)	Low (RRIV)
Other marine users	Minor (2)	Unlikely (B)	Low (RRIV)
Relevant EPO(s)	EPO-ED-11 Impacts to values and sensitivities are minimised in the event of a loss of hydrocarbons.		

5.16.2 Description of Hazard

In the event of an accidental release of MDO or a LOWC, response strategies will be implemented where possible to reduce environmental impacts to ALARP. The selection of strategies will be undertaken through the Spill Impact Mitigation Assessment (SIMA) process, outlined in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] (Appendix E).

The acceptability of the potential environmental impacts and risks associated with the following oil spill response strategies have been evaluated in accordance with VOGA's management systems and sub-regulations 13(5) and 13(6) of the OPGGS(E)R.

While spill response activities are intended to reduce the potential environmental consequences of a hydrocarbon spill, response activities could potentially exacerbate or cause further environmental harm. Decisions regarding spill response activities need to consider both the potential environmental impacts associated with taking no action and the potential environmental impacts associated with a response activity or combination of spill response activities. Poorly planned and coordinated response activities can result in a lack of, or inadequate information and poor decisions being made during incident response.

Response activities can result in:

- Spreading of hydrocarbons further beyond the zone of contamination (e.g. secondary contamination due to hull contamination of response vessels).
- Inadequate surveillance leading to poor information and unforeseen impacts.
- Inappropriate response strategy implemented, and additional sensitive receptors impacted (e.g. use of dispersants when containment and recovery would have been of greater benefit).

This section assesses the available spill response strategies to determine which strategies will be implemented in response to a MDO or a LOWC spill.

The assessment of each response strategy was based on a SIMA approach which considered the advantages and disadvantages of the different spill response options to determine if there would be a net environmental benefit resulting from the implementation of a particular response. This Strategic SIMA considers the hydrocarbon type, threshold levels and sensitivity of the area potentially affected by the spill, and the potential outcomes (positive and negative) of the proposed response strategy. This assessment is summarised in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] (Appendix E).

The SIMA has been undertaken based on predicted information to determine the level of spill response required. In the actual event of a spill, the SIMA is revisited regularly as more information becomes available on actual conditions, spill trajectory path and locations of sensitive receptors. This review process allows response strategies to be adjusted to provide optimal results.

The following spill response activities may be considered for an accidental release of MDO and/or LOWC, under the direction of the appropriate Control Agency:

- Source control
- Monitor and evaluate
- Chemical dispersant
- Mechanical dispersant
- Containment and recovery
- Protection and deflection
- Shoreline clean-up
- Oiled wildlife response
- Scientific monitoring.

See the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] (Appendix E) for justifications for the selected oil spill response strategies.

5.16.3 Impact and Risk Evaluation

The potential additional impacts that may be caused by certain oil spill response activities include:

- Change to water quality
- Change to benthic habitats
- Change coastal habitats and communities
- Change in marine fauna behaviour
- Injury/mortality to marine fauna
- Changes to functions, interests, and activities of other marine users.

The following receptors within the Hydrocarbon Area may be impacted by oil spill response activities:

- Water quality
- Benthic habitats
- Coastal communities
- Marine fauna, such as:
  - plankton

  - benthic invertebrates
  - seabirds and shorebirds
  - fish, sharks and rays
  - marine reptiles
  - marine mammals.
- Other marine users, such as:
  - commercial fisheries.

5.16.3.1 Source control

Source control activities are effective in minimising the quantity of hydrocarbons lost to the environment and reducing the area of potential exposure.

Potential vessel source control activities include:

- Contain diesel onboard
- Isolating tanks
- Tank lightening (transfer to another tank)
- Vessel separation.

Potential LOWC source control activities include:

- Emergency shutdown
- Isolation of equipment
- Surface well intervention
- Drilling a relief well.

Impact Assessment

Source control activities such as emergency shut down, isolation of equipment and surface well intervention will reduce the volume of oil released to the marine environment. Consequently, these response strategies will not create additional impacts on the marine environment over and above the spill itself.

Drilling a relief well may be required if there is a total LOWC incident. The response process to be followed in the event of a loss of well control incident is outlined in the Wandoo Field Source Control Emergency Response Plan (SCERP). If a relief well was required, it would be drilled using a jack-up MODU, within the Permit Area.

The drilling of a relief well will not create any additional impacts on the environment that have not already been assessed for drilling activities within Section 5.1 to 5.15 of this EP. As such, the impact assessments that have been conducted for the impacts and risks associated with vessels and MODU, and drilling activities are considered conservative and sufficient for any source controls. As such, this has not been assessed further.

5.16.3.2 Monitor and evaluate

Several methods can be used to monitor and evaluate, including:

- Vessel and serial surveillance
- Satellite tracking buoys
- Remote (satellite) sensing
- Oil sampling
- Oiled fauna surveys
- Water quality sampling
- Oil Spill Trajectory Modelling (OSTM).

Impact Assessment

The monitoring and evaluation methods will predominantly not create any additional impacts on the environment that have not already been assessed within Section 5.1 to 5.15 of this EP.

The surveillance of the spill size and tracking of its movement using an aircraft may have an additional impact that has not been previously assessed within this EP.

Marine Fauna

Change in Behaviour

Noise emissions generated from an aircraft will be affected by both in-air and underwater propagation processes, in addition to factors such as wind and waves. The level of noise received underwater depends on source altitude and lateral distance, receiver depth, water depth and other variables. Under calm sea conditions, airborne noise is totally reflected and does not enter the water; however, rough seas may provide suitable angles for airborne sound to penetrate the water surface (Richardson et al., 1985).

Simmonds et al. (2004) measured a helicopter flyover at 305 m at 108 dB re 1 µPa, with a frequency of 45 to 70,000 Hz, and Richardson et al. (1995) identified that aircraft operations typically produce noise emissions below 500 Hz, which diminishes with increasing altitude and water depth. Studies on a helicopter which was audible in the air for 4 minutes, was detectable underwater for only 38 seconds at 3 m depth, and 11 seconds at 18 m depth.

Due to the expected noise source levels being lower than those assessed within Sections 5.3 and 5.4, the risk evaluation that was conducted for the noise emissions produced from the exploration drilling activities is considered appropriate and conservative for aircraft operations.

Injury/Mortality

The movement and operation of any aircrafts undertaking spill response activities has the potential to cause injury or death to fauna in the unlikely event of a collision. This is of particular concern for seabirds that may be present within the area. Due to the offshore location of the activity and the lack of habitats critical to the survival of seabirds (Section 3.4.3.3), it is considered unlikely that a collision between an aircraft and seabird will occur. Therefore, the

risk evaluation that was conducted for the physical presence of the vessel operations resulting in an interaction with marine fauna, as assessed in Section 5.12, is considered appropriate and conservative for aircraft operations.

5.16.3.3 Chemical dispersion

The application of chemical dispersant has been identified as a possible key response strategy, dependant on the spill scenario. Chemical dispersant can be applied by:

- Vessel application
- Aerial application.

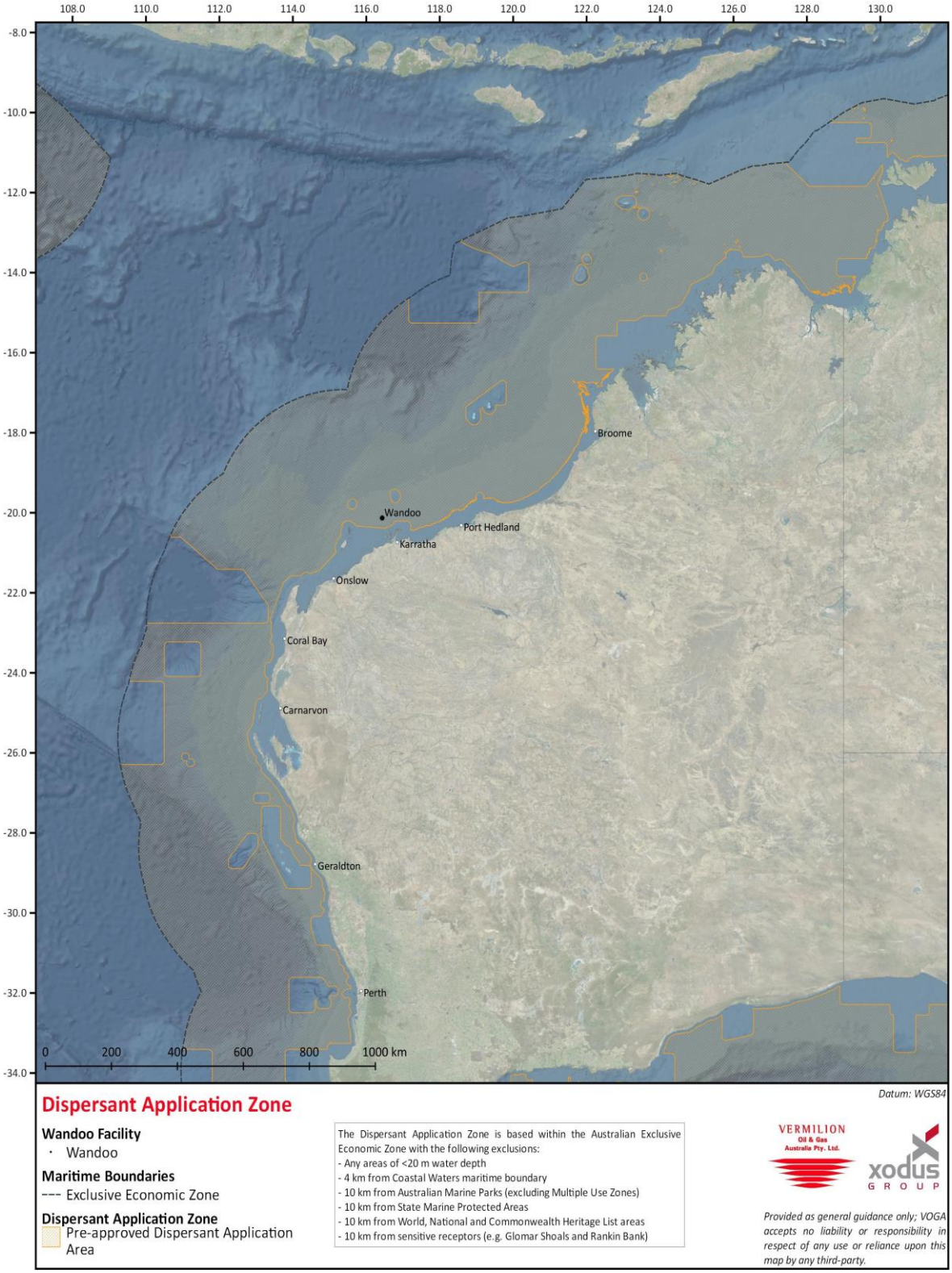
Dispersion Application Zone

Due to potential sensitivities of some species to chemical dispersant, the dispersant will only be applied when the IAP decision-making process has determined that its application will have a net environmental benefit, as supported by the SIMA process, directed by the Control Agency. Furthermore, the chemical dispersant will only be applied within the 'Dispersant Application Zone' which specifically excludes:

- Waters shallower than 20 m
- 4 km from Coastal Waters maritime boundary
- 10 km from Australian Marine Parks (excluding multiple use zones)
- 10 km from State Marine Protected Areas
- 10 km from World National and Commonwealth Heritage List areas
- 10 km from sensitive receptors (e.g. Glomar Shoals and Rankin Bank).

Figure 5-5 details the chemical dispersant application zone.

Figure 5-5: Chemical dispersant application zone



Dispersant Efficacy Testing

Dispersant efficacy testing was undertaken by ChemCentre (2015) (Appendix E) to determine the efficacy profile of dispersants. Test were conducted on fresh and weathered Wandoo Crude for their dispersibility with five different dispersants, including:

- Ardrox
- Corexit 9500A
- Dasic Slickgone EW
- Dasic Slickgone NS
- Finasol OSR 52.

Weathering of Wandoo Crude was tested under both summer and winter weather conditions. As summer exhibited greater weathering, crude weathered in these conditions were used for the dispersant efficacy laboratory tests.

Results from this study informed of the efficacy of a larger range of dispersants and if prolonged chemical dispersant application is viable on the Wandoo Crude.

All the dispersants tested were effective at dispersing a large percentage of the oil on the water up to three days after the spill (Table 5-78). For each dispersant, '10A' represents the percentage of the weathered oil that has dispersed through the water column after ten minutes of agitation and considered to be an effective measure of dispersibility.

Table 5-78: Dispersant trial against the Wandoo Crude, ChemCentre (2015)

Dispersant	Ardrox	Corexit 9500A	Finasol OSR 52	Slickgone EW	Slickgone NS
Oil	**10A**	**10A**	**10A**	**10A**	**10A**
Fresh	86%	100%	100%	100%	100%
1 day weathered	72%	79%	78%	100%	100%
2 day weathered	82%	84%	63%	100%	100%
3 day weathered	89%	100%	100%	100%	100%
4 day weathered	49%	66%	78%	100%	93%
5 day weathered	25%	54%	98%	39%	5%
10 day weathered	13%	35%	31%	23%	-

Note: AMSA accepts a dispersant on to the Oil Spill Control Register (OSCA) if it has a dispersant efficacy of 70%. VOGA modelled a conservative oil spill dispersant efficacy of 50%.

The dispersant trials gave particularly good results for all dispersants if used in the first three days. Of note was the increase in efficacy observed in most samples on a 3-day weathered sample over a 2-day weathered sample. While some variability in results might be expected, three of the dispersants had increased efficacy after three days, while the remaining two

(Slickgone NS and Slickgone EW) were already giving 100% dispersant efficacy. While this result might suggest that spill responders dealing with a 2-day old slick might choose to wait a day to improve their response, this is not recommended due to the difficulty in ensuring that lab trials match the exact weathering conditions of a real spill.

Impact Assessment

The use of vessels to apply the dispersant will not create any additional impacts on the environment that have not already been assessed within Section 5.1 to 5.15 of this EP.

The use of an aircraft to apply the dispersant will not create any additional impacts on the environment that have not already been assessed within Section 5.16.3.2.

The application of chemical dispersant is highly effective in assisting the natural process of biodegradation and minimising the risk of oil impacts to vulnerable coastal receptors, such as on the Dampier Archipelago and the Barrow and Montebello Islands, as well as the mainland of the WA coastline. However, the application of chemical dispersant into the marine environment may have an additional impact that has not been previously assessed, which are associated with its inherent toxicity.

Dispersants currently in use however are much less toxic than early-generation dispersants, with acute toxicity values (measured in standard 96h LC50 tests) typically in the range of 190 to 500 mg/L (Fingas, 2008). In comparison, toxicity of the Water Accommodated Fraction (WAF) for samples of Wandoo Crude was in a similar range of values as typical dispersants (140 to 400 mg/L) (Ecotox, 2012). This was supported in recent studies of a range of dispersants, completed for the USEPA during the Macondo spill response. These studies showed that dispersants alone have only low toxicity, while dispersant-oil mixtures generally have similar toxicity to crude oil alone (Hemmer et al., 2011).

A review of oil spill dispersants by Fingas (2008) confirmed that dispersant toxicity is consistently less than the toxicity of dispersed oil. Dispersant acute toxicity values are typically in the range of 190 to 500 mg/l (NAS, 2005). In comparison, toxicity of the WAF for samples of Wandoo Crude was in a similar range of values (140 to 400 mg/l) (Ecotox, 2012). About half of these found that the cause for this was the increased PAHs, typically about 5 to 10 times, in the water column. PAHs are of particular environmental concern since they are carcinogenic and mutagenic to marine organisms and can persist in the environment for long periods (as opposed to more volatile aromatic hydrocarbons such as BTEX). There is a low risk of toxicity to marine organisms from direct contact or ingestion of entrained Wandoo Crude, due to the low proportion of aromatic hydrocarbons present (APASA, 2013).

The decision to use chemical dispersants, as with all response strategies, is governed by the outcomes of a SIMA. In this case, a SIMA will consider the benefit of reducing the volume of floating oil against the potential impacts of increasing the volume of subsurface oil and the introduction of the chemical dispersant itself. Any dispersant used would be selected from the AMSA OSCA Register prior to use. Criteria for inclusion on the OSCA Register includes a ban on toxic components including benzene, carbon tetrachloride or other chlorinated hydrocarbons, phenols, cresols, caustic alkali, or free mineral acid.

Water Quality

Change to Water Quality

The application of chemical dispersant will result in a localised reduction in the water quality within the receiving marine environment. However, due to the potential negative impacts associated with chemical dispersants, the dispersant will only be applied when the IAP decision-making process has determined that it will have a net environmental benefit, as supported by the SIMA process, directed by the Control Agency. Furthermore, the chemical dispersant will only be applied within the 'Dispersant Application Zone' (Section 5.16.3.3).

Given the extent of the Hydrocarbon Areas and wider EMBAs expected for the two credible spill scenarios, any changes to water quality from the application of chemical dispersant within the restricted 'Dispersant Application Area' are anticipated to be less than the extent of change to water quality that would result from the hydrocarbon spill itself.

As such, any impacts to water quality due to chemical dispersant application are anticipated to be highly localised and short-term, with rapid recovery expected following the cessation of the oil spill response.

Marine Fauna

The application of chemical dispersant into the marine environment has the potential to result in injury/mortality to marine species due the potential toxicity effects of the chemical dispersant. In general, the sensitivity of species to chemical dispersants depends on the species type and life-stage, the dispersant type, volume, and exposure duration.

For some species, the use of chemical dispersants can effectively reduce the severity of hydrocarbon impact. Dispersing oil into the water column reduces the quantity of oil on the surface, subsequently reducing the amount of oil that can strand and smother any resource which it comes into contact with species such as turtles, migratory birds, seabirds and shorebirds. However, species present within the water column such as whales, dugongs, dolphins and sharks could be negatively affected by the increased concentration of dispersed oil and associated chemicals in the water column.

Potential impacts from the use of chemical dispersants include:

- Increased toxicity to marine fauna due, to the addition of dispersant chemicals to the marine environment.
- Increased toxicity to marine fauna due to dispersed oil in the water column in the form of entrained oil and dissolved oil.

The decision to use chemical dispersants, as with all response strategies, is governed by the outcomes of a SIMA. In this case, a SIMA will consider the benefit of reducing the volume of floating oil against the potential impacts of increasing the volume of subsurface oil and the introduction of the chemical dispersant itself. Also any dispersant used would be selected from the AMSA OSCA Register prior to use. Criteria for inclusion on the OSCA Register includes a ban on toxic components including benzene, carbon tetrachloride or other chlorinated hydrocarbons, phenols, cresols, caustic alkali, or free mineral acid.

Table 5-79 summarises the potential impacts and risks to marine fauna from the application of dispersant.

Table 5-79: Risk assessment for the application of chemical dispersant on marine fauna

Marine fauna	Exposure evaluation	Predicted impact of dispersant application
Plankton	Plankton has been identified as a receptor that may be present within the Hydrocarbon Area with the potential to be exposed to concentrations of dispersant if applied. As discussed in Section 3.4.3.1, plankton are found in nearshore and open waters beneath the surface.	Planktonic organisms could be impacted by dispersant via a number of pathways. Previous studies have shown that cell membranes of single celled plankton can be damaged, ultimately impacting the survivability of the individual (Hook & Osbourne 2012). Plankton are numerous and widespread. Plankton distribution and composition is also not uniform and is influenced by natural variations in the oceans such as salinity, temperature, nutrient availability and currents. Any direct effects on plankton communities are likely to rapidly replenish any losses from reproduction by survivors or migration from unaffected areas (Volkman et al., 1994). The proximity of nutrient-rich seasonal upwelling events which occur within the vicinity will further assist recovery rates. As such, any impact to plankton from the application of chemical dispersant will be localised, short-term impacts, with recovery expected following the cessation of the oil spill response. As such, a consequence ranking of '2' (Minor) was assigned.
Benthic invertebrates	Benthic invertebrates may be present within the Hydrocarbon Area with the potential to be exposed to concentrations of dispersant if applied. Benthic invertebrate are typically restricted to shallow nearshore and intertidal waters (Section 3.4.3.2).	Previous studies have demonstrated that benthic invertebrates are the most sensitive to chemical dispersants, with some results indicating the potential for lethal impacts following exposure (Wise et al., 2019). Sub-lethal impacts to benthic invertebrates include tissue decomposition, gene-expression changes, and physical stress (Wise et al., 2019). Embryonic and larval stages appear to be more sensitive than adults to both dispersants and dispersed oil with LC50s reported to be as low as 3 mg/L for dispersant alone in a study on oyster larvae (Clark et al., 2001). Dispersed oil is typically rapidly entrained within the top 1 m of the water column and within 24 hours the dispersed oil is likely to mix within the top 10 m of the water column (Lee et al., 2013). Benthic invertebrates are typically restricted to shallow nearshore and intertidal waters, outside of the main exposure area predicted within 0 – 10 m of the sea surface, indicating that exposure to chemical dispersant may be unlikely following application within the Dispersant Application Zone. As such, any impact to benthic invertebrates from the application of chemical dispersant may result in be localised, short-term impacts, with recovery expected following the cessation of the oil spill response. As such, a consequence ranking of '2' (Minor) was assigned.

Marine fauna	Exposure evaluation	Predicted impact of dispersant application
Fish, including sharks and rays	Various fish and shark species may be present within the Hydrocarbon Area (Section 3.4.3.4). A foraging BIA for the whale shark was identified within the Hydrocarbon Area (Section 3.4.4). Therefore fish and sharks have the potential to be exposed to concentrations of dispersant if applied.	There is a lack of data on the toxicity of dispersants to large predatory fish, such as sharks and rays. Impacts are likely to be similar to those described for fish as they are predominantly pelagic species. As chemically dispersed oil moves away from the spray zone, the dissolution of dispersant results in lower potential toxicity to species exposed to the dispersed oil. Dispersant application results in an increase in oil becoming entrained in the water column this significantly increased the potential for exposure of sharks throughout the water column (Gulf Coast Research Laboratory, 2013). A study conducted by Fuller et al. (2004) indicated that the toxicity of chemically dispersed oil preparations on two fish species, *Cyprinodon variegatus* and *Menidia beryllina* was equal or less toxic than that of the oil alone. The potential for impact is highest at the point of application, where the concentration of dissolved hydrocarbons and/or dispersant chemicals is greatest. Exposure to dispersed oil is concentrated in the top portion of the water column and decreases fairly rapidly over time in areas with depths over 9 m and good circulation (NRC, 1989). Spill modelling results predict that the use of dispersants will increase the potential zones of low and moderate concentration of entrained hydrocarbons. Entrained oil is unlikely to affect species that exist in the water column due to its low toxicity, the low periods of exposure that could occur and the low dosage of oil that may be received. Therefore, elevated concentrations of dispersant could result in acute toxicity to marine biota such as juvenile fish, larvae, and planktonic organisms, although impacts are expected to be close to the application location. As such, any impacts to adult and juvenile fish, including sharks and rays, will be localised, short-term impacts, with recovery expected following the cessation of the oil spill response. As such, a consequence ranking of '2' (Minor) was assigned.
Seabirds	Several species of seabirds have the potential to be rafting, resting, diving and feeding within the area predicted to be contacted by surface hydrocarbons, and diving	Seabirds could be impacted by in-water dispersant exposure directly (i.e. whilst diving through the water column foraging) or indirectly (i.e. by consuming dispersant-tainted fish, resulting in sub-lethal or toxic impacts).

Marine fauna	Exposure evaluation	Predicted impact of dispersant application
	or foraging within in-water hydrocarbons. Four breeding BIAs for seabirds intersect the Hydrocarbon Area (Section 3.4.3.3), including: • Fairy tern (EPBC Act listing as vulnerable) • Lesser crested tern (EPBC Act listing as migratory) • Roseate tern (EPBC Act listing as migratory) • Wedge-tailed shearwater (EPBC Act listing as migratory).	Application of dispersant or dispersed oil in the water column presents much lesser risk to seabirds and waders than leaving an oil spill untreated, as it reduces their exposure to hydrocarbons (French-McCay, 2004). Dispersants may remove the natural water repellent oils from bird feathers (Boyd et al., 2001) making them less buoyant and more vulnerable to hypothermia. Higher metabolic rates were also found in birds exposed to dispersant, presumably due to the increased energy suspended to maintain a normal body temperature (Lambert et al., 1982). The use of dispersants increases the amount of oil that physically mixes into the water column, thus reducing the potential for a surface slick to come into contact with seabirds that frequent the air water interface. Peakall et al. (1987) concluded that, from the toxicological perspective, the effects of oil and chemically dispersed oil on seabirds were similar, based on sub-lethal responses at the biochemical and physiological level. Similarly, studies on the effects of oil on the hatching success of bird eggs (NRC, 1989 and 2005) also indicated that toxicities of oil and dispersed oil were similar. As such, any impact to seabirds from the application of chemical dispersant is expected to be reversible and short-term. As such, a consequence ranking of '1' (Incidental) was assigned.
Marine reptiles	Marine reptiles, such as marine turtles and sea snakes, may be present within the Hydrocarbon Area and have the potential to be exposed to dispersant concentrations when transiting through or when surfacing to breathe within the Dispersant Application Zone. BIAs and habitat critical for the survival of marine turtles for 4 species of marine turtles intersect the Hydrocarbon Area (Section	<u>Marine turtles</u> The application of dispersant reduces the oil level on the surface thus reducing the level of exposure to the oil of marine reptiles that return to the sea surface to breathe. Sea turtles may be exposed to dispersants either internally (eating or swallowing oil, or inhaling of volatile oil related compounds) or externally (swimming in oil or dispersants, or oil or dispersants on skin and body) (NOAA, 2012). Direct contact of skin with petroleum compounds or dispersants may cause skin irritation, chemical burns, and infections. Inhalation of dispersants may irritate or injure the respiratory tract which may lead to inflammation or pneumonia. Ingestion of petroleum compounds or dispersants may cause injury to the gastrointestinal tract, which may affect the animals' ability to absorb or digest foods.

Marine fauna	Exposure evaluation	Predicted impact of dispersant application
	3.4.3.6 and Section 3.4.4), including: • Flatback turtle (EPBC Act listed as vulnerable) • Green turtle (EPBC Act listed as vulnerable) • Hawksbill turtle (EPBC Act listed as vulnerable) • Loggerhead turtles (EPBC Act listed as endangered). EPBC Act listed sea snakes that are found within the Hydrocarbon Area include: • Short-nosed sea snake (EPBC Act listed as critically endangered) • Leaf-scaled sea snake (EPBC Act listed as critically endangered) • Dubois' sea snake (EPBC Act listed as marine).	Absorption of petroleum compounds or dispersants may damage liver, kidney, and brain function as well as causing anaemia and immune suppression. As chemically dispersed oil moves away from the spray zone, the dissolution of dispersant results in lower potential toxicity to species exposed to the dispersed oil. The use of dispersants increases the amount of oil that physically mixes into the water column thus reducing the potential for a surface slick to come into contact with marine reptiles such as turtles that surface to breathe. The use of dispersants may also reduce the volume of oil that ends up on shorelines and the probability of oil reaching shorelines, thus reducing the impact to hatchling and turtles using nesting beaches. <u>Sea snakes</u> There are no specific studies on sea snakes reported in the scientific literature, but impacts are likely to be similar to those described for turtles as they are often seen at the sea surface. Dispersed oil is unlikely to affect marine reptiles due to its low toxicity, the low periods of exposure that could occur and the low dosage of oil that may be received. As such, any impact to marine reptiles from the application of chemical dispersant is expected to be reversible and short-term. As such, a consequence ranking of '1' (Incidental) was assigned.

Marine fauna	Exposure evaluation	Predicted impact of dispersant application
Marine mammals	Several marine mammal species were identified by the EPBC Protected Matters Search for the Hydrocarbon Area (Section 3.4.3.5) including: • Sei whale (EPBC Act listing as vulnerable) • Blue whale (EPBC Act Listing as endangered) • Fin whale (EPBC Act listing as vulnerable) • Southern right whale (EPBC Act listing as endangered). A Migration BIA for the humpback whale intersects the Hydrocarbon Area. These marine mammals have the potential to be exposed to dispersant concentrations when transiting through or when surfacing to breathe within the Dispersant Application Zone.	In general, the impacts of the dispersants themselves are considered to be less than that of entrained oil, given the toxicity values for the dispersant, and Wandoo Crude. A potential impact of dispersants is the removal of natural water repellent oils from marine mammal fur (sea lion), making them less buoyant and susceptible to hypothermia (Kucklick et al., 1997). However, this is unlikely to occur given that dispersant application is not proposed in known sea lion habitat, and concentrations of dispersant will reduce outside of the application area. Generally, the use of dispersant will increase the amount of oil that physically mixes into the water column thus reducing the potential for a surface slick to come into contact with marine mammals that surface to breathe. The application of dispersant reduces the oil level on the surface in most cases thus reducing the level of exposure to the oil of surface dwelling organisms such as marine mammals. Dispersed oil is unlikely to affect marine mammals due to the low toxicity of dispersed oils, low period of exposure that could occur and the low dosage of oil that may be received. As such, any impact to marine mammals from the application of chemical dispersant is expected to be reversible and short-term. As such, a consequence ranking of ‘1’ (Incidental) was assigned.

Benthic and Coastal Habitats

The application of chemical dispersant into the marine environment has the potential to result in changes to benthic and coastal habitats and assemblages due the potential toxicity effects of the chemical dispersant. In general, the sensitivity of habitats to chemical dispersants depends on the species type and life-stage, the dispersant type, volume, and exposure duration.

For some species, the use of chemical dispersants can effectively reduce the severity of hydrocarbon impact. However, species present within the water column such as coral reef and biological processes such as coral spawning, could be negatively affected by the increased concentration of dispersed oil and associated chemicals in the water column.

Potential impacts from the use of chemical dispersants include:

- Increased toxicity to marine habitats due, to the addition of dispersant chemicals to the marine environment.
- Increased toxicity to marine habitats due to dispersed oil in the water column in the form of entrained oil and dissolved oil.

During testing for the Montara spill, APASA (2010) found that effects associated with dispersed oil were mostly contained within the top metre of the water column, with the concentration quickly reducing with time, depth and distance from the application site. PTTEP (2013) further concluded that the concentration of hydrocarbons within the water column, due to dispersed oil, was low relative to the amount that was already in the water column from the release. Lee et al. (2013) also found that dispersed oil is rapidly entrained within the top 1 m of the water column and within 24 hours the dispersed oil is likely to mix within the top 10 m of the water column and be rapidly diluted.

The decision to use chemical dispersants, as with all response strategies, is governed by the outcomes of a SIMA. In this case, a SIMA will consider the benefit of reducing the volume of floating oil against the potential impacts of increasing the volume of subsurface oil and the introduction of the chemical dispersant itself. Also any dispersant used would be selected from the AMSA OSCA Register prior to use. Criteria for inclusion on the OSCA Register includes a ban on toxic components including benzene, carbon tetrachloride or other chlorinated hydrocarbons, phenols, cresols, caustic alkali, or free mineral acid.

Table 5-80 summarises the potential impacts and risks to marine fauna from the application of dispersant.

Table 5-80: Risk assessment for the application of chemical dispersant on benthic and coastal habitats

Habitat	Exposure evaluation	Predicted impact of dispersant
Corals	Biologically significant coral reef formations are found within the nearshore shallow areas of islands within the Hydrocarbon Area (i.e. Montebello Islands) , and therefore, has the potential to be exposed to concentrations of chemical dispersant if applied. However, predominantly the seafloor in the Hydrocarbon Area is comprised of fine silt/sand substrates with low densities of benthic communities (Section 3.4.1).	Coral species are expected to be especially susceptible due to the life history and habitat characteristics (NAP, 2005). However, coral sensitivity to dispersed oil depends on the concentration and the length of exposure. Very high dispersed oil concentrations and long exposures can kill coral, whereas lower doses and short-term exposure show few, if any, impacts, many of which are reversible (Shingenaka et al., 2010). Studies of coral larvae clearly demonstrate impacts of dispersants and dispersed oil on corals. A study of the settlement of *P.astreoides* larvae, in particular, demonstrated significant decreases after exposure to all concentrations of dispersant (25 ppm, 50 ppm, 100 ppm), with no settlement occurring at the highest concentration (100 ppm). This study also demonstrated that constant exposure to certain dispersants (Corexit 9500) resulted in dramatic declines in larval survivorship, with complete larval mortality (100%) occurring after exposure to both medium (50 ppm) and high (100 ppm) concentrations (Goodbody Grinley et al., 2013). The application of dispersant will, typically, increase oil exposure for water column and bottom dwelling organisms such as hard coral (Boyd, et al., 2001). As discussed above, the dispersed oil is typically rapidly entrained within the top 1 m of the water column and within 24 hours the dispersed oil is likely to mix within the top 10 m of the water column (Lee et al., 2013). Therefore, exposure to benthic habitats is unlikely to occur. Furthermore, chemical dispersant will only be applied within the 'Dispersant Application Zone'. This indicates the following: • no dispersant will be sprayed in areas with water depth of less than 20 m depth. • dispersant use should be considered to treat oil over reefs in water depths greater than 20 m if the alternative is to allow the oil to impact other sensitive habitats on shore. • dispersion is not recommended to treat oil already in reef habitats having low-water exchange rates (e.g., lagoons and atolls) if mechanical clean-up methods are possible. • dispersant-use decisions to treat oil already over a reef should consider the type of oil and location of the reef.

Habitat	Exposure evaluation	Predicted impact of dispersant
		Given corals are typically found within the nearshore shallow areas of islands it is unlikely that corals will be impacted by chemical dispersant as the concentration of dispersant reduces rapidly outside the application zone. As such, any impact to corals from the application of chemical dispersant will be localised, short-term impacts, with recovery expected following the cessation of the oil spill response. As such, a consequence ranking of '2' (Minor) was assigned.
Coral spawning	Significant coral spawning occurs in autumn for a number of species, although some taxa such as Porites and Acropora spp. may spawn in spring and summer (Section 3.4.1.2). Spawning events have been observed throughout the Dampier Archipelago in March and April and along the Ningaloo Coast during March (Section 3.4.1.2). Therefore exposure to concentrations of chemical dispersant may occur depending on the timing of the dispersant application.	Chemically dispersed oil exposures has been shown to result in a dramatic increase in acute toxicity to coral species larvae. In addition, dispersants and dispersed oil treatments have been shown to cause larval morphological deformations, loss of normal swimming behaviour, and rapid tissue degeneration (Epstein et al., 2000). Dispersants have been shown to result in significant inhibition to Acropora sperm and eggs (Negri and Heyward, 2000). Given the sensitivity of embryo and larval stages to the impacts of toxicity, there is a particular risk if the timing of a spill, and subsequently the timing of the response (chemical application into the marine environment), overlaps with the timing of a species reproduction event (i.e. a spawning event). This could lead to some component, or all of a year class, to be impacted. As such, any impact to coral spawning from the application of chemical dispersant will be localised, short-term impacts, with recovery expected following the cessation of the oil spill response. As such, a consequence ranking of '2' (Minor) was assigned.
Macroalgae	Macroalgae is widespread within shallower hard substrate areas within the Hydrocarbon Area (Section 3.4.1), and therefore, has the potential to be exposed to concentrations of chemical dispersant if applied.	Virtually all macroalgae, in particular rhodophyte species are more susceptible to dispersants than to oil (Edgar & Barrett, 1995). Complete or partial mortality of kelps is possible at exposure concentrations (>10 ppm) of TPH as chemically dispersed oil (Ross, 2002). Entrained oil at these thresholds is unlikely to cause mortality to sea kelp. However, as discussed above, dispersed oil will typically rapidly entrain within the top 1 m of the water column and within 24 hours the dispersed oil is likely to mix within the top 10 m of the water column (Lee et al., 2013). Furthermore, chemical dispersant will only be applied within the 'Dispersant Application Zone'. This indicates the following: • no dispersant will be sprayed in areas with water depth of less than 20 m depth.

Habitat	Exposure evaluation	Predicted impact of dispersant
		As such, exposure to benthic habitats, such as macroalgae typically found within shallow water environments is unlikely to occur. As such, any impact to macroalgae from the application of chemical dispersant is expected to be reversible and short-term. As such, a consequence ranking of '1' (Incidental) was assigned.
Seagrass	Key areas of seagrass habitats are found within the nearshore shallow areas of the Hydrocarbon Area (i.e. the Ningaloo Reef area) (Section 3.4.1), and therefore, has the potential to be exposed to concentrations of chemical dispersant if applied.	Chemically dispersed oil exposure to seagrass communities has been shown to result to adversely affect seagrass species. Most dispersant alone treatments caused photosynthetic stress to the seagrass, and in some cases, this was greater than the dispersed oil and the oil alone treatments (Wilson and Ralph, 2008). Ralph and Burchett (1998) found that laboratory-cultured Halophila ovalis was reasonably tolerant of petrochemical exposure and there was little difference between exposure to oil, oil + dispersant and dispersant alone. Seagrasses have been shown to absorb more aliphatic and aromatic oil fractions when the oil is dispersed, therefore increasing the toxicity (den Hartog, 1984). Non-dispersed oil, in general, leads to less photosynthetic stress to *Zostera capricorni* and *Halophila ovalis* compared with the addition of a chemical dispersant (Wilson and Ralph, 2008). However, as discussed above, dispersed oil will typically rapidly entrain within the top 1 m of the water column and within 24 hours the dispersed oil is likely to mix within the top 10 m of the water column (Lee et al., 2013). Furthermore, chemical dispersant will only be applied within the 'Dispersant Application Zone'. This indicates the following: • no dispersant will be sprayed in areas with water depth of less than 20 m depth. As such, exposure to benthic habitats, such as seagrass typically found within shallow nearshore water environments, is unlikely to occur. As such, any impact to seagrass from the application of chemical dispersant is expected to be reversible and short-term. As such, a consequence ranking of '1' (Incidental) was assigned.

Protected and Significant Areas

The application of chemical dispersant into the marine environment has the potential to result in a change in ecosystem dynamics and conservation values pf protected and significant areas due to impacts to sensitive values.

Potential impacts from the use of chemical dispersants include:

- Increased toxicity to marine fauna and habitats due, to the addition of dispersant chemicals to the marine environment.
- Increased toxicity to marine fauna and habitats due to dispersed oil in the water column in the form of entrained oil and dissolved oil.

As discussed above, the decision to use chemical dispersants, as with all response strategies, is governed by the outcomes of a SIMA. In this case, a SIMA will consider the benefit of reducing the volume of floating oil against the potential impacts of increasing the volume of subsurface oil and the introduction of the chemical dispersant itself. Also any dispersant used would be selected from the AMSA OSCA Register prior to use.

Table 5-81 summarises the potential impacts and risks to marine fauna from the application of dispersant.

Table 5-81: Risk assessment for the application of chemical dispersant on protected and significant areas

Habitat	Exposure evaluation	Predicted impact of dispersant
Marine Parks	The Hydrocarbon Area intersects a number of Australian Marine Parks (AMPs) and State Parks as outlined in Table 3-12 and Table 3-13. The major conservation values for AMPs and State Marine Parks have been identified in Section 3.6.4 and Section 3.6.5, respectively. In general the AMPs include examples of unique ecosystems with characteristics that support diverse benthic or intertidal habitats, and often a range of species listed under the EPBC Act, often including BIAs, such as breeding and foraging habitat for seabirds, internesting, foraging, mating, and nesting habitat for marine turtles, breeding, calving, foraging and nursing habitat for dugongs, foraging habitats, and migratory pathway for certain marine species, such as humpback whales, pygmy blue whales, whale sharks.	The impact of dispersant and dispersed oil on the values associated with Marine Protected Areas has already been assessed above in terms of the key ecological values. As discussed above, chemical dispersant will only be applied within the 'Dispersant Application Zone'. This ensures that dispersant application will not be applied within: • 10 km Australian Marine Parks (excluding multiple use zones) • 10 km from State Marine Protected Areas • 10 km from sensitive receptors (e.g. Glomar Shoals and Rankin Bank). Given the extent of the Hydrocarbon Areas and wider EMBAs expected for the two credible spill scenarios, any impacts to Marine Parks from the application of chemical dispersant within the restricted 'Dispersant Application Area' are anticipated to be less than the extent of impacts that would result from the hydrocarbon spill itself. Therefore, the risk evaluation that was conducted for the risks to Marine Parks following the release of MDO and a LOWC, within Sections 5.14 and 5.15, respectively, is considered appropriate and conservative here.
Key Ecological Features	The Hydrocarbon Area intersects various KEFs as described in Table 3-14. The conservation values for these KEFs have been described in Section 3.6.7 and may include unique seafloor environments, and sensitive reefs and shoals that are considered to be of regional importance for a region's biodiversity or ecosystem function and integrity. Some of the KEFs, such as the Glomar shoals, are areas of high productivity and aggregations of marine life and known to be an important area for a number of commercial and recreational fish species and consist of a high	The impact of dispersant and dispersed oil on the values associated with KEFs has already been assessed above in terms of the key ecological values. As discussed above, chemical dispersant will only be applied within the 'Dispersant Application Zone'. This ensures that dispersant application will not be applied within: • Waters shallower than 20 m • 4 km from Coastal Waters maritime boundary • 10 km from sensitive receptors (e.g. Glomar Shoals and Rankin Bank). Given the extent of the Hydrocarbon Areas and wider EMBAs expected for the two credible spill scenarios, any impacts to KEFs from the application of chemical dispersant within the restricted 'Dispersant Application Area' are anticipated to be less than the extent of impacts

Habitat	Exposure evaluation	Predicted impact of dispersant
	percentage of marine-derived sediments with high carbonate content and gravels of weathered coralline algae and shells (DCCEEW, 2024j).	that would result from the hydrocarbon spill itself. Therefore, the risk evaluation that was conducted for the risks to KEFs following the release of MDO and a LOWC, within Sections 5.14 and 5.15, respectively, is considered appropriate and conservative here.

Other Marine Users

Changes to Functions, Interests and Activities of Other Marine Users

Other marine users, such as commercial fisheries, which are active within the region have the potential to be impacted by the application of chemical dispersants into the marine environment.

The physical displacement of commercial fishers from the area due to the establishment of exclusion zones during the spill response has the potential to cause a negative economic impact. However, any exclusion zone that will be established for the application of chemical dispersant will ultimately be spatially smaller than the extent of the hydrocarbon spill itself. As such, the risk evaluation that was conducted for the impact to other marine users within Sections 5.14 and 5.15, is considered appropriate and conservative for the risk of changes to functions, interests, and activities of other marine users from the application of chemical dispersant.

As discussed above on the assessment of chemical dispersant to marine fauna, benthic invertebrates are the most sensitive to chemical dispersants, with some results indicating the potential for lethal impacts following exposure (Wise et al., 2019). Toxicity exposure may result in a reduction in commercially targeted marine species (i.e. fish and invertebrate species), subsequently resulting in impacts to commercial fishing productivity.

Furthermore, any contamination of target species can also result in economic impacts to the industry. Given that embryos, larvae and juvenile fish are the most sensitive to toxicity, there is a particular risk if the timing of a spill, and subsequently the timing of the response (chemical application into the marine environment), overlaps with the timing of a species reproduction event (i.e. a spawning event). This could lead to some component, or all of a year class, given that most species have seasonal pulsed recruitment, of commercially targeted marine species (i.e. fish and invertebrate species) to be impacted.

Due to potential sensitivities of some species to chemical dispersant, the dispersant will only be applied when the IAP decision-making process has determined that its application will have a net environmental benefit, as supported by the SIMA process as directed by the Control Agency. Furthermore, the chemical dispersant will only be applied within the 'Dispersant Application Zone'.

As such, given the extent of the Hydrocarbon Areas and wider EMBAs expected for the two credible spill scenarios, any impacts to marine fauna from the application of chemical dispersant within the restricted 'Dispersant Application Area' are anticipated to be less than the extent of impacts to marine fauna that would result from the hydrocarbon spill itself. Therefore, the risk evaluation that was conducted for the risks to marine fauna following the release of MDO and a LOWC, within Sections 5.14 and 5.15, respectively, is considered appropriate and conservative for the risk of injury/mortality to marine fauna from the application of chemical dispersant.

5.16.3.4 Mechanical dispersion

Mechanical dispersion is the use of fire monitors, engine wash, or other means to mechanically/ physically disperse oils into the water column, thereby increasing the speed with which

weathering and biodegradation occurs. This strategy is a secondary strategy that may be considered for Wandoo crude spills that result from activities within the Wandoo Field.

Impact Assessment

In general, the use of vessels to accelerate the dispersion of the hydrocarbons will not create any additional impacts on the environment that have not already been assessed within Section 5.1 to 5.15 of this EP. The potential use of vessels for propeller-washing to mechanically disperse spilt oil in shallow coastal waters may introduce the potential for impacts to benthic habitats.

Benthic Habitats and Assemblages

Change to Benthic Habitat and Assemblages

The use of propeller-washing to mechanically disperse spilt oil in shallow coastal waters may result in damage to sensitive seabed habitats such as coral reefs, macro-algae beds and seagrasses. Potential damage could occur from accidental vessel grounding or propeller-wash (turbulence) in shallow water. These impacts could include scouring of sediments and physically damaging/removing subtidal habitat, together with any supported invertebrate communities. Mechanical dispersion will only be carried out in waters deeper than 20 m; therefore, any impacts to benthic habitats, sediments and subtidal habitats are unlikely.

5.16.3.5 Containment and recovery

Containment and recovery operations use booms to create physical barriers on the water surface to contain the oil spill. Once contained, the operation uses skimming equipment to recover the hydrocarbons from the surface waters. This strategy is typically only used in the offshore environment in close proximity to the hydrocarbon source.

The response strategy primary relies on the use of suitable vessels, experienced crew, booms, skimmers, pumps, on-board storage for recovered oil and aircrafts to direct the vessel(s) undertaking the operation.

Impact Assessment

The use of vessels to undertake containment and recovery operations will not create any additional impacts on the environment that have not already been assessed within Section 5.1 to 5.15 of this EP.

The use of an aircraft to direct the containment and recovery operations may have additional impacts that has not been previously assessed. This has been assessed within Section 5.16.3.2.

Other Marine Users

Changes to functions, interests, and activities of other marine users

The presence of spill responders, vessel, and the associated clean-up operations may lead displacement or an exclusion of other marine users, such as commercial fishers and shipping, operating within affected areas. The physical displacement other marine users from the area due has the potential to cause a negative economic impact. However, any exclusion zone that will be established for the containment and recovery operations will ultimately be spatially

smaller than the extent of the hydrocarbon spill itself. As such, the risk evaluation that was conducted for the impact to other marine users within Section 5.14 and 5.15, is considered appropriate and conservative for the risk of changes to functions, interests, and activities of other marine users from implementation of containment and recovery operations.

5.16.3.6 Protection and Deflection

Protection and deflection is the use of physical barriers to separate oil from environmental sensitivities, or to deflect the oil to other areas where it may be naturally collected, or to other areas where the oil will do less harm. This involves the establishment of a nearshore boom across the shoreline interface, typically involving the anchoring/attachment of one end of a nearshore boom in the nearshore environment and the other end within the supratidal shoreline habitat.

The tactics of protection and deflection predominantly include nearshore-booming operations, which include:

- Vessel operations
- Shallow water operation-vessel boom nearshore booming including anchoring and retrieval
- Shore-based booming (i.e. personnel)
- Use of barriers.

Impact Assessment

In general the use of vessels to undertake protection and deflection operations will not create any additional impacts on the environment that have not already been assessed within Section 5.1 to 5.15 of this EP.

The anchoring/attachment of the nearshore boom within the nearshore water and on the shoreline, including shoreline response workers deployed to the shorelines may have an additional impact that has not been previously assessed.

Benthic Habitats

Change to Benthic Habitats

Shoreline response activities, such as strategies that used during protection and deflection, have the potential to impact shallow coastal areas or benthic habitats where sensitive habitats and aggregations of wildlife may be present. In particular, the use of vessels and the anchoring of nearshore booms within nearshore environments has the potential to disturb sensitive near-shore benthic habitats, such as corals, seagrass, macroalgae and mangroves. Any impacts to benthic ecosystems from seafloor abrasion, dislodgement, and increased sedimentation from vessel and nearshore booms, is anticipated to be highly localised. As such, a consequence ranking of ‘1’ (Incidental) was assigned.

Coastal Communities

Change to Coastal Communities

Shoreline response activities, such as strategies that used during protection and deflection, have the potential to impact coastal habitats. The potential impacts of protection and deflection response will vary, depending on the method used and the nearshore/shoreline habitat. For example, a loss of vegetation may occur depending on the placement of the protection booms and poorly placed deflection booms could potentially direct floating oil to shoreline areas where impacts could be more severe (e.g. mangrove areas) and exacerbate the level of impact and recovery time for the ecosystem.

As with all spill response activities, this disturbance will only occur if a net benefit to accessing and protecting shoreline areas have been established via the completion of a SIMA process. Control measures and response plans will be established prior to the commencement of any shoreline response actives to provide guidance and instruction to responders on how to reduce impacts to sensitive receptors, as outlined in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] (Appendix E).

Sensitive receptors identified in this EP will be avoided when placing protection and deflection booms. As such, impacts to benthic habitats and communities and coastal habitats has been anticipated to potentially result in localised, short-term, impacts to habitats with recovery expected following the cessation of the oil spill response. No impacts to local ecosystem or population functioning is expected. As such, a consequence ranking of '2' (Minor) was assigned.

5.16.3.7 Shoreline Clean-up

Shoreline clean-up involves monitoring shorelines and/or the removal of hydrocarbons that have accumulated on the shorelines. In general shoreline clean-up tactics include:

- Physical cleaning - removal/disposal:
  - natural recovery
  - manual clean-up (i.e. use of shovel, rakes, sieves)
  - mechanical clean-up (i.e. use of machinery)
  - vacuum systems
  - use of sorbents.
- Physical cleaning - washing:
  - low and high pressure flushing
  - steam cleaning
  - sand blasting.
- Physical cleaning – in-situ:
  - surf washing/sediment reworking.
- Treatment:
  - bioremediation.

Impact Assessment

Shoreline clean-up operations, including the removal of hydrocarbons, the tactic used, and the presence of shoreline response workers and equipment deployed to the shorelines, will have an additional impact that has not been previously assessed.

Coastal Communities

Change in Coastal Communities

The potential impacts of shoreline response activities will vary, depending on the nature and scale of the spill, the method used, and the nearshore/shoreline habitat impacted. MDO will weather rapidly, with often only a small fraction comprising persistent residuals. Under low energy conditions, the residual components may form a thin liquid sheer on the coast and may persist in the environment; this may allow them to be physically removed. Shoreline response will be considered as a primary response strategy in the event of that a LOWC of crude results in shoreline accumulation. Due the hydrocarbon characteristics of Wandoo crude (see Section 5.15), physical removal will be required if a net environmental benefit is determined.

Shoreline type plays an important role in determining the most suitable clean-up techniques that might be most suitable for removing the oil (ITOPF, 2014). In general natural recovery methods are the most effective for sensitive shorelines, such as mangroves and saltmarshes, or inaccessible rocky shore platforms found within the Hydrocarbon Area. Shoreline clean-up is typically only considered for sandy beaches affected by hydrocarbons. Accessing shorelines for clean-up will have associated ecological constraints, especially if accessing uninhabited, sensitive coastal areas. Physical clean-up methods can alter the elevation or profile of beaches, which may lead to erosion of beaches following the clean-up process, particularly if heavy machinery is used. Table 5-82 summarises the sensitivity and potential impact of shoreline clean-up techniques on various habitat types.

Environmentally intrusive or potentially damaging activities should only be considered if there is a positive net environmental benefit. A SIMA will need to be carried out before shoreline clean-up operations commence to ensure that attempts to remove weathered oil result in a net benefit, as outlined in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] (Appendix E). A range of control measures will be established prior to the commencement of shoreline response actives, as detailed within the OPEP (specifically within WAN-WNAB-CP-ER-02 / WAN-WNAB-CP-ER-03). As such, any change to coastal communities from shoreline response activities will be managed so that any impacts are reduced to localised, short-term impacts, with recovery expected following the cessation of the oil spill response activity. As such, a consequence ranking of ‘2’ (Minor) was assigned.

Table 5-82: Potential impacts of shoreline clean-up activities

Habitat type	Potential impacts of activities	Priority/action
Mangroves	Mangroves are amongst the hardest to clean as they are sensitive to physical damage by clean-up operations and often have high environmental sensitivity (ITOPF, 2014). The damage cause by the physical disturbance of clean-up operations has the potential to cause more damage to the mangrove communities than the oil itself. Mechanical removal and high-pressure flushing has the potential to cause damage to mangroves and should not be attempted. Trampling associated with manual clean-up also has the potential to cause damage to mangroves. Sorbents may be used, as they eliminate the requirement for foot traffic and mechanical equipment. However, this technique is not recommended for high energy shorelines, as sorbents may be lost during periods of high wave action or tidal movement. It may also generate large volumes of waste. Low pressure flushing with seawater may be used for thick films only. It has the potential to cause removal or mortality of surface organisms and surface and near surface habitat disturbance.	High As certain methods of shoreline clean-up have the potential to cause damage to mangrove habitats, focus should be on prevention of further hydrocarbon entry by using protection and deflection. If oil ends up in mangrove habitats, leaving residual oil to weather and degrade naturally is usually recommended, as mangroves have been shown to be more easily damaged by the physical disturbance caused by clean-up teams and vehicles, than by the oil itself.
Saltmarsh	Saltmarsh habitats, like mangrove habitats, are difficult to clean as they are sensitive to physical damage by clean-up operations and often have high environmental sensitivity (ITOPF, 2014). The use of heavy equipment, poorly supervised manpower and the removal of oiled sediment have led to long-term damage due to trampling, damage to root systems and consequent erosion (IPIECA, 2015). In general, cutting vegetation has not been found to improve recovery rates except for spills of heavy fuel oil or heavy crude oils. Wherever possible, it is preferable to allow oil that arrives on this type of shoreline to whether naturally. Where the removal of oil is essential, low pressure flushing and manual cleaning are typically the best options.	High As certain methods of shoreline clean-up have the potential to cause damage to saltmarsh habitats, focus should be on prevention of further hydrocarbon entry by using protection and deflection.

Habitat type	Potential impacts of activities	Priority/action
Beach and Mudflats		
Intertidal beaches/ mudflats	Natural recovery is the preferable clean-up method for this type of shoreline, particularly where oil has been washed up on vegetation. On many occasions activities such as mechanical or manual clean-up have resulted in more damage than allowing natural recovery to take place due to trampling and substrate erosion. Where removal of oil is essential to prevent its remobilisation and spreading along the shoreline, low pressure flushing can be used. Potential impacts include removal or mortality of surface organisms and surface and near-surface habitat disruption. Oil can be transported to lower intertidal or previously clean areas, and subtidal organisms may be buried by downslope sediment transport. Most organisms living in these sediments are highly sensitive to the components of oil. Polychaete worms and other soft-bodied organisms are particularly susceptible to oil contamination. Recovery periods will be determined to a large extent by the degree of penetration and persistence of oil in the sediment. Experimental work has indicated two to four years for recovery (O'Sullivan et al., 2001).	High-medium Some mudflats also support diverse biological communities that are allocated a high priority for protection and cleaning.
Rocky shorelines/ intertidal reef platforms	<u>Rocky cliffs</u> Manual clean-up of rocky cliffs may be difficult due to: • absence of access • high sea states • dangerous working conditions. Typically, cliffs and inaccessible rocky coves are highly exposed and are best left to clean naturally unless there are overriding reasons to do otherwise (IPIECA, 2015). <u>Intertidal reef platforms</u> Vacuum systems can be used to collect heavy (thick) or pooled deposits of oil where access is possible. Vacuum equipment also has the potential to cause damage to sensitive habitats and should not be used where foot traffic and equipment operation is restricted.	Low Rocky cliffs often do not require cleaning as: • oil has been held off the coast by wave reflection • self-cleaning is rapid due to exposure to high wave energies. Platforms, which lie in the lower intertidal zone, are generally afforded a low priority, because oil tends not to adhere to the wet surfaces (i.e. wave exposed surface) and is rapidly removed. Platforms in the mid to upper intertidal

Habitat type	Potential impacts of activities	Priority/action
	Sorbents may be used as they eliminate the requirement for foot traffic and mechanical equipment. However, this technique is not recommended for high energy shorelines, as they may be lost during periods of high wave action. It may also generate large volumes of waste. Low pressure washing with hot or cold seawater may be used, as this is effective to flush floating or loose oil out of tidal pools, depressions, crevices, etc. and remove oil from vegetation. Potential impacts of low pressure washing includes removal or mortality of surface organisms and surface and near-surface habitat disruption. Oil can be transported to lower inter tidal or previously clean areas and subtidal organisms may be buried by downslope sediment transport (Owens, 1998). <u>Boulder beaches</u> Manual removal may not be suitable as access to rocky shore is difficult and particular attention needs to be given to safety of workers on particular surfaces in addition to hazards of waves and tides (ITOPF, 2011). Low pressure washing with hot or cold seawater may be used, as this is effective in flushing floating or loose oil out of tidal pools, depressions, crevices, etc. and in removing oil from vegetation. Potential impacts include removal or mortality of surface organisms and surface and near-surface habitat disruption. Oil can be transported to lower intertidal or previously clean areas, and subtidal organisms may be buried by downslope sediment transport. In areas of high concentrations of wildlife, where significant amounts of oil have stranded, loose sorbent material can be spread over oiled rocks to reduce contamination of fur or feathers (ITOPF, 2011). However, there is a potential that secondary contamination may result from drifting mats of the oil sorbent mixture. <u>Cobble beaches/pebble beaches</u> Mechanical or manual clean-up techniques may not be suitable on this type of shoreline, as the movement of both vehicles and personnel have the potential to cause oil to penetrate into the spaces between stones and deep into the beach. Low pressure washing with hot or cold seawater may be used, as this is effective in flushing floating or loose oil out of tide pools, depressions, crevices, etc. and removing oil from vegetation (ITOPF, 2014).	zone are also generally self-cleaning and therefore oil does not persist. Natural recovery is effective on weathered and heavy crude in most situations for both boulder and cobble/pebble beaches and causes the least environmental impact.

Habitat type	Potential impacts of activities	Priority/action
	Potential impacts include removal or mortality of surface organisms and surface and near-surface habitat disruption. Oil can be transported to lower inter tidal or previously clean areas, and subtidal organisms may be buried by downslope sediment transport. Surf washing may be suitable on moderate to high energy shorelines where moderately oiled sediments are located in the higher portions of the upper intertidal or supratidal zone. Potential impacts include: • oil and/or sediments could damage healthy biological communities in the lower intertidal zone • oil that is released is rarely fully contained and could impact adjacent areas, and • sediment loss resulting from alongshore suspension and movement of sediment in the water on fine-grained sediment beaches.	
Sandy beaches	Mechanical clean-up may be suitable for sandy beaches, provided the beach can support heavy machinery. This method can result in shoreline erosion if excessive material is removed without replacement. However, for most exposed beaches, the seasonal cycles of erosion and accretion are so large that the amount of material removed during clean-up operations is usually insignificant in comparison and will normally be replaced naturally (ITOPF, 2014). Temporary roadways may be constructed to allow heavy equipment onto the beach to avoid damage to fragile dune habitats (ITOPF, 2014). Manual clean-up may be used where access is restricted, if oiling is light, or if the beach cannot support heavy vehicles. Surf washing may be suitable on moderate to high energy shorelines where moderately oiled sediments are located in the higher portions of the upper intertidal or supratidal zone. Buried oil might be mobilised through harrowing or ploughing, or by using flushing lances to release the oil and flush it to the water's edge where it can be recovered with skimmers or sorbents. Re-floated oil can be collected using booms and skimmers. Vacuum trucks or systems may be used on pooled oil, or where oil is very thick. Typically sandy beaches have a low biological activity, and generally sparse fauna compared to other shoreline types.	High Beaches used by nesting turtles and/or seabirds are given a high priority for protection and clean-up. A high protection priority will also be given to recreational beaches or those of high economic value.

Marine Fauna

Change in Behaviour

The use and movement of vehicles, equipment and personnel during shoreline response activities can directly disturb marine fauna individual and important habitats of threatened and migratory fauna, including nests of turtles and birds and bird roosting areas. Furthermore, shoreline clean-up may require strategies which physically remove of substrates, which could directly impact marine faun and their habitats. As with all spill response activities, this disturbance will only occur if a net benefit to accessing and cleaning shoreline areas have been established via the completion of a SIMA process.

As discussed within the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] (Appendix E), a range of control measures will be established prior to the commencement of shoreline response actives. For example, operational restrictions on equipment and vehicle use will be implemented to limit impact to sensitive or important areas for marine and terrestrial fauna. The establishment of any shoreline forward operating base, and the shoreline response activities themselves will be done under the under direction of the relevant Control Agency, DoT and DBCA, with suitable advice sought if access is needed to culturally significant areas. Shoreline teams will also be informed of how to avoid encounters with marine fauna.

The main direct disturbance to fauna would be the hazing, capture, handling, transportation, cleaning and release of wildlife susceptible to oiling impacts, discussed below.

As such, disruption to marine fauna may result from shoreline response activities, however, the impacts are anticipated to be localised, short-term, with recovery expected following the cessation of the oil spill response. As such, a consequence ranking of ‘2’ (Minor) was assigned.

Other Marine Users

Changes to functions, interests, and activities of other marine users

The presence of hydrocarbons on shorelines, and the associated clean-up operations, depending on location, may lead to temporary beach closures. Any recreational activities present in affected areas will be excluded until access is again granted by local authorities. MDO is expected to weather rapidly with clean-up operations expected to take days-weeks following source control, whereas a LOWC that resulting in shoreline accumulation of Wandoo crude may persistent and require moderate to high clean-up operations.

Precautionary exclusion from impacted areas following a hydrocarbon spill may be implemented until spill operations cease. The could result in a temporary disruption to some recreational and tourism activities within and area for the duration of the response. Closure of a certain area or attraction, resulting in economic losses to the business are likely to eventuate. The presence of shoreline clean-up operations along a shoreline have the potential to reduce the visual amenity of known heritage sites along the coastline, subsequently potentially impacting the value of the site to First Nations people. These impacts would likely result temporary exclusion from a medium to large proportion of commercial or recreational enterprise depending on the hydrocarbon accumulation where recovery is expected to occur within 1 year of the activity stopping. As such, a conservative consequence ranking of ‘3’ (Moderate) was assigned.

5.16.3.8 Oiled wildlife response

Oiled wildlife response has the potential to cause impacts to marine fauna. Activities associated with oiled wildlife response that can cause impacts to marine fauna include:

- Hazing
- Pre-emptive capture
- Search and capture
- Field stabilisation
- Cleaning and rehabilitation
- Termination.

Impact Assessment

Marine Fauna

Change in Behaviour

Oiled wildlife response activities have the potential to disrupt marine fauna. Activities such as hazing involves the use of visual, auditory or sensory deterrents to keep healthy marine fauna away from the hydrocarbon spill. This can lead to disturbance of marine fauna, such as the separation of groups or adults/juveniles, collisions with marine fauna, inadvertent movement of animals into the oiled area, or scattering of oiled animals.

Pre-emptive capture involves the capture and relocation of marine fauna before they become oiled. Potential impacts include relocation to inappropriate areas that will not support the animal's requirements (e.g. habitat, food sources).

Despite there being the potential of impacts to marina fauna from oiled wildlife response, these impacts are likely to be less than the potential impacts and risks posed to marine fauna from the hydrocarbon spill itself, as discussed in Sections 5.14 and 5.15. Therefore, risk evaluation that was conducted for the accidental release of MDO and a LOWC is considered conservative for oiled wildlife response activities.

Injury/Mortality

Marine fauna have the potential to be injured during oiled wildlife response activities, such as search and capture. The goal of search and capture is to collect as many live oiled animals as quickly as possible and in the best possible condition to maximise survival. However, in the event that their physical condition is already poor due to the indirect or direct exposure to hydrocarbons, inexperienced handling can rapidly exacerbate their condition. Prompt initialisation of an oiled wildlife response with trained responders that quickly and effectively collects wildlife and provides a means for humane euthanasia, or rehabilitation and release, will minimise suffering.

Field stabilisation is required prior to further treatment of oiled animals, to ensure they can cope with the cleaning and rehabilitation process that will follow. Effective field stabilisation requires deployment of adequate handlers to appropriate locations in a timely manner.

Despite there being the potential of impacts to marina fauna from oiled wildlife response, these impacts are likely to be less than the potential impacts and risks posed to marine fauna from the hydrocarbon spill itself, as there is a chance that some marine fauna will experience lethal impacts from the hydrocarbon, as discussed in Sections 5.14 and 5.15. As such, the risk evaluation that was conducted for the accidental release of MDO and the LOWC, within Section 5.14 and 5.15, respectively, is considered appropriate and conservative for the risk of injury/mortality to marine fauna from oiled wildlife response activities.

5.16.3.9 Scientific Monitoring

Scientific monitoring is used to quantify the impact of associated response strategies, such as the use of chemical dispersants and shoreline clean-up. Various scientific monitoring sampling plans may be implemented, depending on the nature and scale of the spill, and the associated implemented response strategies.

An example of scientific monitoring strategies that may be activated include:

- Water quality impact assessment (SMP1)
- Sediment quality impact assessment (SMP2)
- Intertidal and coastal habitat assessment (SM3)
- Seabirds and shorebirds (SM4)
- Marine megafauna:
  - reptiles (SMP5)
  - whale sharks, dugongs and cetaceans (SM6)
- Marine fish and elasmobranch assemblages assessment (SMP7)
- Fisheries impact assessment (SM8).

See the Operational and Scientific Monitoring Bridging Implementation Plan [VOG-110-RG-0002] (Appendix E) for the mobilisation and activation criteria(s) for the selected monitoring plans.

Impact assessment

In general, majority of the scientific monitoring strategies (i.e. study scopes) will not create any additional impacts on the environment that have not already been assessed within Section 5.1 to 5.15 of this EP, such as associated with vessel operations, and seabed disturbances.

The presence of scientific monitoring SMEs and equipment deployed to the shorelines, use of shallow vessels, aircraft operations, and any additional impacts to oiled marine fauna, may have an additional impact that has not been previously assessed. These have already been assessed as a part of the other oil spill response activities above in Sections 5.16.3.2, 5.16.3.4, 5.16.3.7 and 5.16.3.8.

5.16.4 Risk Ranking

In the event of an accidental release of MDO or a LOWC, response strategies may be implemented that have the potential to impact environmental receptors and other marine

users. Given the nature and scale, and purpose of the response activities discussed in Section 5.16.2, the potential impacts and risks will be less than the impacts of the spills themselves, as assessed within Section 5.1 to 5.15. Response strategies or tactics such as aircraft operations, chemical dispersant application, shoreline response operations, and oiled wildlife activities, may create additional impacts on the environment that have not already been assessed within Sections 5.1 to 5.15. Given the nature and scale of these response activities short-medium term impacts to individuals or habitats, not affecting species population, was identified. Therefore:

Chemical dispersion:

- The consequence ranking of '2' (Minor) was assigned to water quality, plankton, benthic invertebrates, fish, including sharks and rays and corals, and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'RRIV' (Low).
- The consequence ranking of '1' (Incidental) was assigned to seabirds and shorebirds, marine reptiles, marine mammals, macroalgae, and seagrass, and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'RRIV' (Low).

Shoreline response:

- The consequence ranking of '3' (Moderate) was assigned to coastal communities and marine fauna and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'RRII' (Medium).
- The consequence ranking of '2' (Minor) was assigned to coastal communities and marine fauna and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'RRIV' (Low).
- The consequence ranking of '1' (Incidental) was assigned to benthic habitats, and a likelihood of 'B' (Unlikely) was considered appropriate, resulting in a risk ranking of 'RRIV' (Low).

5.16.5 ALARP Demonstration

Table 5-83: Demonstration of ALARP – Environmental Impact of Oil Spill Response

Control measure	Performance outcome	Performance standard	Measurement criteria
Elimination			
None identified	-	-	-
Substitution			
None identified	-	-	-
Prevention			
Ensure the most effective response strategies are being applied and environmental impact of the spill and response strategies are measured.	EPO-ED-11	• Monitoring shall be activated from time of spill detection to inform implementation of response strategies. • Preliminary Oil Spill Trajectory Modelling (OSTM) to be requested	IAP records.

		within 3 hours of a spill being reported. • Satellite tracking buoys to be deployed within 30 minutes of a spill being reported. • Environmental data to support decision making (IAP) and spill impact assessment shall be available prior to impact.	
Application of chemical dispersant in accordance with the dispersant application zone.	EPO-ED-11	Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application.
Application of mechanical dispersant activities in accordance with application zones.	EPO-ED-11	Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-03 - Response strategy - Mechanical dispersant application (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-03 - Response strategy - Mechanical dispersant application.
Oil spill response personnel understand and competently perform their response roles.	EPO-ED-11	Performance criteria shall apply, as per WAN-WNAB-CP-ER-01-05 - Arrangements are understood (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-01-05 - Arrangements are understood.
Reduction			
Increase the rate of biodegradation to reduce the environmental impact from surface oil and oil stranding on shoreline sensitivities.	EPO-ED-11	Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application.
Minimise environmental impacts associated with dispersant application.	EPO-ED-11	Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application.
Mitigation			
Minimise potential impacts on fauna caused by oiled wildlife response activities.	EPO-ED-11	Induction and training shall cover any special handling requirements to minimise further detrimental impacts to flora and fauna.	Induction material. IAP records. Wildlife response (Appendix I).
		Wildlife strategy including hazing, if required, shall be developed in consultation with the Department of Transport.	IAP records.

Deployment of equipment will be undertaken by trained incident response personnel.	EPO-ED-11	Performance criteria shall apply, as per: • WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery • WAN-WNAB- CP-ER-03-04- Response strategy – Protection and deflection • WAN-WNAB- CP-ER-03-06- Response strategy – Shoreline clean-up (Appendix I).	Assurance activities, as per: • WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery • WAN-WNAB- CP-ER-03-05- Response strategy –Protection and deflection • WAN-WNAB- CP-ER-03-06- Response strategy – Shoreline clean-up.
Reduce overall volume of surface oil to minimise impacts to environmental sensitivities.	EPO-ED-11	Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery.
Minimise environmental impacts to priority near-shore environmental sensitivities by reducing oil contact.	EPO-ED-11	Performance criteria shall apply as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection.
Minimise environmental impacts associated with improperly deployed equipment.	EPO-ED-11	Performance criteria shall apply as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection.
Minimise impact to fauna from oil spill response activities.	EPO-ED-11	Performance criteria shall apply as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection.
Remove stranded hydrocarbons from shorelines without causing greater environmental impact than leaving the hydrocarbons in-situ.	EPO-ED-11	Assurance activities, as per WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up.
Minimise impact to key shoreline habitats associated with shoreline clean-up activities.	EPO-ED-11	Assurance activities, as per WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up (Appendix I).	Assurance activities, as per WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up.
Minimise environmental impacts associated with improperly deployed equipment.	EPO-ED-11	Performance criteria shall apply, as per: • WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery	Assurance activities, as per: • WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery

		• WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection (Appendix I).	• WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection.
Booms shall only be installed after consultation and approval from the Department of Transport.	EPO-ED-11	Performance criteria shall apply, as per: • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection • WAN-WNAB-CP-ER-03-06- Response strategy – Shoreline clean-up (Appendix I).	Assurance activities, as per: • WAN-WNAB-CPER-03-05 - Response strategy – Protection and deflection • WAN-WNAB- CP-ER-03-06- Response strategy – Shoreline clean-up.
Shoreline assessments will be used to select appropriate shoreline clean-up techniques.	EPO-ED-11	Performance criteria shall apply, as per: • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection • WAN-WNAB- CP-ER-03-06- Response strategy – Shoreline clean-up (Appendix I).	Assurance activities, as per: • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection • WAN-WNAB- CP-ER-03-06- Response strategy – Shoreline clean-up.
Environmental monitoring of impact of the spill and response strategies.	EPO-ED-11	The Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] shall be implemented inclusive of an environmental monitoring plan which considers: • Environmental impact associated with the spill and response strategies • Environmental sensitivities to be monitored • Monitoring methods and type • Sources of baseline data • Resources required and mobilisation times • Termination criteria.	Results from environmental monitoring plan are available for IAP.
Other			
Current oil spill response arrangements are accessible to all personnel in the event of an oil spill.	EPO-ED-11	Oil spill response documentation is up to date, maintained and readily available within VOGA Information Systems.	HSE MS audits of Element 8 are conducted in accordance with the HSEMS Element 12 – Performance

			Assurance Manual [VOG-1100-YG-1201.02].
Considered Control Measures	**Assessment of option**		**Decision**
Establish demarcation zones for vehicle and personnel movement considering sensitive vegetation, bird nesting and roosting areas and turtle nesting habitat.	Reduces the risk to potential and identified bird nesting/roosting and turtle nesting areas. Cost considered proportionate to the environmental benefit.		Adopted (refer to Table 7-2).
ALARP Summary: The impacts and potential risks from oil spill response are ALARP, based on the impact assessment outcomes using VOGA Risk Matrix (as per Table 4-3), the ALARP template to determine the appropriate decision context type (Table 4-1) and VOGA's criteria for demonstrating ALARP (Section 4.2). Through the ALARP process, additional controls have been identified that would further reduce the impacts without disproportionate sacrifice.			

5.16.6 Acceptability Demonstration

Table 5-84: Acceptability Demonstration – Environmental Impact of Oil Spill Response

Acceptable level of impact/risk demonstrated	
Principles of ESD not compromised	Relevant Principles of ESD not compromised given proposed controls (Table 5-83).
External context – objections or claims considered	N/A – no external objections or claims received.
Internal context – VOGA HSE policy/procedures met	Yes – Risk managed in accordance with VOGA HSE policy. Potential spills to be managed in accordance with Wandoo Emergency Response Plan [VOG-2000-RD-0017]/Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].
Other requirements met	Yes – Notice to Mariners issued via AMSA in a timely manner. Potential spills to be managed in accordance with SOPEP/SMPEP (equivalent to class).
RR < High (RRII)	Yes – Low (RRIV).
EPO(s) manage impacts to acceptable level(s)	Yes – The following relevant EPOs will be maintained: • EPO-ED-11 See Section 7 for further details.
Acceptability Summary: The impacts and potential risks from oil spill response have been managed to a level that is broadly acceptable based on the demonstration of ALARP (Table 5-83), alignment with industry best practice, and VOGA's process for evaluating acceptability (Section 4.7).	

Section 6 Cumulative Impact Assessment

In alignment with NOPSEMA's Environment Plan Decision Making Guideline criterion 10A(d) (NOPSEMA, 2024a), VOGA has assessed the cumulative impacts associated with the exploration drilling activities. In the context of offshore petroleum activities, cumulative environmental impacts are defined by NOPSEMA as successive, additive, or synergistic impacts of collectively significant activities or projects with material impacts on the environment that have the potential to accumulate over temporal and spatial scales (NOPSEMA, 2024a).

The effects of past projects and activities, and currently operating activities, are captured when describing the existing condition of and any pressure or threats affecting the environment (see (Section 3). This baseline condition and understanding of the capacity of the receiving environment and receptors to accommodate changes, considering existing pressures and threats, informs the environmental hazard assessment conducted in Section 5 of this EP.

The focus of this Cumulative Impact Assessment (CIA) is to build on these assessments by considering the potential impacts from the planned components of the proposed activity on key matters in conjunction with the potential impacts from other reasonably foreseeable future projects and activities. Given that unplanned events are not intended to occur as a result of the exploration drilling activities, risks from unplanned aspects have not been considered in the CIA.

6.1 Methodology

There is no specific guidance on CIA provided by NOPSEMA or the Australian Government for the OPGGSA or EPBC Act assessment regimes. Therefore, other relevant guidance has been used to inform the CIA methodology for this EP, including:

- UK Nationally Significant Infrastructure Projects Advice Note Seventeen: Cumulative effect assessment relevant to nationally significant infrastructure projects (Planning Inspectorate, 2019); and
- NSW Department of Planning and Environment Cumulative Impact Assessment Guidelines for State Significant Projects (Department of Planning, Infrastructure and the Environment (DPIE), 2022).

Both the UK and DPIE guidelines are intended to apply to large-scale national and state significant projects, respectively, with greater potential for cumulative impacts into the long-term. Consequently, the assessment approach applied here has been adapted to the nature and scale of the activities covered in this EP.

6.2 Scoping the Cumulative Impact Assessment

A scoping assessment was undertaken to determine if impacts from the project activities could result in cumulative impacts to receptors.

The scoping process considered the following factors:

- **Other reasonably foreseeable future projects** to be considered in the CIA based on currently operating projects, approved projects, and projects under assessment (including those under public comment); and if these projects and their associated activities are reasonably foreseeable within the spatial and temporal extent of the assessment.

This defines the boundaries of the assessment by including projects and activities that have a realistic likelihood of occurring and potential contribution to cumulative impacts.

- **Key environmental matters** are features of the environment (ecological, socio-economic, and cultural values and sensitivities) that are valued because of their rarity or importance, including the critical role they play in supporting systems which are essential for the environment, people and / or the economy (DPIE, 2022). For example, commercial fisheries and threatened species undertaking biologically important behaviours.

- **Spatial extent** is the study area for the CIA, depending on the key environmental matters' range and distribution within the bioregion; and environment that may be affected by the planned activities. DPIE (2022) recommends that while the area chosen for each key matter must be broad enough to capture all relevant cumulative impacts, it should not be unnecessarily large or include areas where the cumulative impacts are likely to be negligible relative to the baseline condition of the relevant matter.

- **Temporal extent** is the period of the CIA, depending on the duration of the planned activities or characteristics of the key environmental matters.

- **Material cumulative impacts** resulting from the and other relevant future projects that have the potential to be above the defined acceptable levels. For example, threats of wide-scale, serious or irreversible damage due to cumulative impacts.

- **Cumulative impact assessment approach** based on standard assessment of material cumulative impacts, identify which cumulative impacts require further comprehensive assessment through either issue-specific CIA or combined CIA.

To identify the above factors, the scoping assessment was undertaken in two parts.

- **Part 1**: Identify reasonably foreseeable future projects and activities (Section 6.2.1).

- **Part 2**: Identify relevant key environmental matters (Section 6.2.2).

The DPIE Guidelines (2022) state that the CIA is to focus on the key matters that could be materially affected by the cumulative impacts of the project and other relevant future projects—not on every conceivable cumulative impact on every matter.

The scoping assessment identifies potential cause-effect pathways which could result in material cumulative impacts.

6.2.1 Part 1: Identify Reasonably Foreseeable Future Projects and Activities

To identify relevant future projects and activities, spatial and temporal extents for cumulative impacts have been based on the maximum spatial and temporal influence of the Project activities.

The spatial extent of impacts and risks from the project varies depending on the source of aspect. The largest potential impact area for any planned aspect from the exploration drilling activities are a change in fauna behaviour caused by continuous underwater noise from vessel operations and drilling activities, for which a conservative spatial extent of 20.7 km from the Operational Area was adopted (Section 5.6). The next largest potential impact area is associated with disruption to marine fauna which may be caused by light emissions caused by MODU and vessel emissions during exploration drilling activities, for which a conservative spatial extent of 20 km from the Operational Area was adopted (Section 5.3).

Therefore, as a conservative approach, a spatial extent of 25 km has been used for the purposes of identifying existing and future projects and activities which may have effects that overlap with those the project, resulting in potential cumulative impacts.

The temporal extent selected for the CIA considers the planned commencement of exploration drilling activities in 2026-2027, which can take up to 119 days for a total of 7 wells (Section 2.3). The temporal end date selected for the CIA has been conservatively set as 2031, which allows for the five-year validity of this EP (once approved).

The scoping steps of Part 1 are as follows:

- Step 1: Review NOPSEMA Environment Plan and DEMIRS GeoVIEW websites to identify projects and activities that overlap the spatial (25 km from the Operational Area) and temporal (2026-2031) extents.
- Step 2: Confirm potential overlap with other North-west Shelf petroleum titleholders.

Relevant future projects and activities identified to date, within the lifetime of the project (2026-2031) and located 25 km from the Project Operational Area, are detailed in Table 6-1. Projects and activities that are not relevant have been excluded from the assessment scope to maintain practicality and relevance in decision-making processes.

There are several petroleum pipelines within 25 km of the Project activities Operational Area. These are detailed in Table 6-1.

There are no subsea cables which overlap with the Project Operational Area or the 25 km spatial extent, therefore they have not been considered further.

Existing activities and relevant future activities that are included within the scope of the following CIA are those that can be publicly identified at the time of preparing and submitting this EP. Assumptions around specific timings for projects or activities have been made as there is some level of uncertainty in schedule and timing of approvals to support activities. Consequently, a conservative approach has been adopted whereby credible worst-case scenarios (e.g. concurrent activities with overlapping predicted impacts) are assessed.

Table 6-1: Part 1 - Relevant future projects or activities in the North-west Shelf region

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
Petroleum activities						
Jadestone Energy	Stag field production and export facility operations. The Central Production Facility (CPF) has been in production since 1998 (Jadestone Energy, 2025). Includes routine production and well intervention, crude oil loading activities, routine inspection, maintenance and repair of the CPF, subsea export pipeline, wells and associated subsea infrastructure (including use of ROV and diving activities).	Accepted	EP covers the operation of offshore facilities for the five-year duration of the EP (accepted March 2025).	Yes – potential temporal overlap of Stag field operations with the Project exploration drilling activities. Inspection, maintenance and repair work may include SSS activities, likely to be applied for several days at a time every few years.	Yes – potential spatial overlapping of Stag field operations light emissions and noise emissions with the Project activities.	**Yes**. Potential temporal and spatial overlaps identified.
Santos	Commonwealth exploration vessel based activities to support future petroleum exploration, development and operational programs (Santos, 2021). Includes geophysical, hydrographic, geotechnical, ROV, metrology, metocean and environmental surveys.	Accepted	EP has a proposed activity schedule of 2021 – 2026 with activity taking place any time for the five-year duration of the EP (accepted March 2021).	No – the project was approved March 2021 and notified NOPSEMA of a stop date 17 October 2021.	Yes – potential spatial overlapping of the Commonwealth exploration activities as the proposed permit Areas (A, B and C) EMBA's overlap with Project activities.	**No**. Spatial overlap but no temporal overlap identified.

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
Santos	Reindeer Wellhead Platform (WHP) and Devil Creek gas supply pipeline operations. Includes all activities that are associated with the operation of the WHP and gas supply pipeline. Ongoing operations and maintenance activities may involve additional personnel and the use of ROVs, divers and work vessels, which may require anchoring at or near the work location. Subsea, pipeline and seafloor imaging surveys may be undertaken around the production wells and gas supply pipeline using methods such as MBES and SSS (Santos, 2019).	Accepted	EP covers the operation of offshore facilities for the five-year duration of the EP (accepted July 2020).	No – the project was approved July 2020 to allow for activities within 5 years. Therefore, temporal overlap of the Reindeer operations with the Project exploration drilling activities is not expected to occur. Santos has submitted a separate operations and Cessation of Production (CoP) Environment Plan (currently under assessment) with facilities expected to go into CoP late 2024 or early 2025 (described below).	Yes – potential spatial overlapping of Reindeer field light emissions extent (gas supply pipeline) with the Project activities underwater noise and light emissions extent.	**No**. Spatial overlap but no temporal overlap identified.

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
Santos	Reindeer facilities operations, CoP activities. During the operations phase or CoP phase, IMMR campaigns may be undertaken which include activities such as, surface inspections, subsea inspections and well intervention activities (Santos, 2024).	Accepted	The Reindeer facilities are expected to go into CoP phase in late 2024 or early 2025. During CoP phase, IMMR campaigns may be undertaken. Individual general IMMR campaigns are expected to take around 14 days (Santos, 2024).	Yes – potential temporal overlap of Reindeer CoP activities with the Project exploration drilling activities.	Yes – potential spatial overlapping of Reindeer field light emissions and noise emissions extent with the Project activities noise and light emissions extent.	**Yes**. Potential temporal and spatial overlaps identified.
Woodside Energy	Operations of the Scarborough Offshore Facility and Trunkline. Includes hook-up of the Scarborough Floating Production Unit (FPU) (moorings and subsea system) and commissioning activities, routine production for up to 13 subsea wells (up to eight wells, export of dry gas through the gas export trunkline (ETL), Inspection, Monitoring, Maintenance and Repair (IMMR) for the FPU and ETL, and gravimetry survey (Woodside Energy, 2025).	Accepted	EP has a proposed earliest commencement 2H 2025 for FPU hook-up and commissioning. IMMR including contingent flowline and trunkline pigging may occur any time post infrastructure installation and throughout the five-year duration of the EP (accepted February 2025).	Yes – potential temporal overlap of Scarborough ETL IMMR activities with the Project exploration drilling activities.	Yes – potential spatial overlapping of Scarborough ETL Operational Area which is located within 25 km of the Project activities Operational Area.	**Yes**. Potential temporal and spatial overlaps identified.

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
Woodside	Operations of the existing North Rankin Complex facility. Includes routine production of dry gas and condensate, routine and non-routine operations of the facility and associated subsea infrastructure, routine and non-routine IMMR of the platform, export pipelines and associated subsea infrastructure, platform well intervention, workovers and clean-up activities (Woodside, 2024).	Under assessment	The NRC EP was submitted August 2024 and is currently under assessment with NOPSEMA. North Rankin facility operates 24 hours a day, 365 days a year. Maintenance activities are undertaken as required to support day-to-day operations (Woodside, 2024).	Yes – potential temporal overlap of the North Rankin pipelines IMMR activities.	Yes – potential spatial overlapping as the North Rankin pipelines Operation Area which is located within 25 km of the Project activities Operational Area.	**Yes**. Potential temporal and spatial overlaps identified.
Woodside Energy	Operations of the existing Pluto facility. Includes routine production and associated activities, routine IMMR of the platform and associated subsea infrastructure, well clean up and commissioning, new well drilling in the Xena field, subsea infrastructure installation, and pre-commissioning and commissioning activities (Woodside Energy, 2024).	Under assessment	The Pluto EP was submitted May 2024 and is currently under assessment with NOPSEMA. Maintenance campaigns including IMMR typically last for 14 days, with ten campaigns planned per year (Woodside, 2024).	Yes – potential temporal overlap of the Pluto export pipeline IMMR activities.	Yes – potential spatial overlapping as the Pluto LNG gas export pipeline to Burrup Operational Area is located within 25 km of the Project activities Operational Area.	**Yes**. Potential temporal and spatial overlaps identified.

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
Commercial fisheries						
Western Tuna and Billfish Fishery	Pelagic longline and low levels of minor-line fishing are used in this fishery.	Active	12 month fishing season, commencing 1st February each year.	Yes – potential temporal overlap of fishing vessel activities with timings of the project activities. (Butler et al., 2024)	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in Commonwealth waters.	**Yes**. Potential temporal and spatial overlaps identified.
Western Skipjack Tuna Fishery	Purse seine and pole & line are used in this fishery.	Not active	Not active since 2009.	No – the fishery is not currently active, and no fishing has occurred since 2009.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in Commonwealth waters.	**No**. Spatial overlap but no temporal overlap identified.
Southern Bluefin Tuna Fishery	Pelagic longline and purse seine fishing gear are used in this fishery.	Active	12 month fishing season, commencing 1st December each year.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in Commonwealth waters.	**Yes**. Potential temporal and spatial overlaps identified.

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
Abalone Managed Fishery	Hand collection method is used in this fishery.	Not active	12 month fishing season, from February – January.	No – the fishery is not currently active.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**No**. Spatial overlap but no temporal overlap identified.
Hermit Crab Fishery	Hand collection method is used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes**. Potential temporal and spatial overlaps identified.
Mackerel Managed Fishery	Surface and midwater troll fishing are used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes**. Potential temporal and spatial overlaps identified.
Marine Aquarium Fish Managed Fishery	Hand collection and fishing line methods are used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings	Yes – the fishery management area overlaps the Project Operational Area.	**Yes**. Potential temporal and spatial overlaps identified.

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
				of the Project activities.	Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	
Nickol Bay Prawn Fishery	Low opening, otter prawn trawl systems are used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes**. Potential temporal and spatial overlaps identified.
Onslow Prawn Limited Entry Fishery	Low opening, otter prawn trawl systems are used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes**. Potential temporal and spatial overlaps identified.
Pilbara Crab Managed Fishery	Hourglass traps are used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes**. Potential temporal and spatial overlaps identified.

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
Pilbara Fish Trawl Interim Managed Fishery	Trawl, trap and line methods are used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in Commonwealth waters.	**Yes**. Potential temporal and spatial overlaps identified.
Pilbara Line Fishery (Condition)	Trawl, trap and line methods are used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes**. Potential temporal and spatial overlaps identified.
Pilbara Trap Managed Fishery	Trawl, trap and line methods are used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes**. Potential temporal and spatial overlaps identified.
South-west Coast Salmon Fishery	Seine nets are used in this fishery.	Not active	3-month fishing season, February – April. (DCCEEW, 2024q)	No – the fishery is not currently active.	Yes – the fishery management area overlaps the Project Operational Area.	**No**. Spatial overlap but no temporal

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
					Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	overlap identified.
Specimen Shell Managed Fishery	Hand collection is the main method used in this fishery. In some instances, remotely operated underwater vehicles are used (Newman et al., 2023a).	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes**. Potential temporal and spatial overlaps identified.
Tour Operator	Range of methods including hook and line, surface and midwater troll methods.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – no defined management area. However, the fishery is permitted to fish anywhere in WA-state waters.	**Yes**. Potential temporal and spatial overlaps identified.
West Coast Deep Sea Crustacean Managed Fishery	Baited pots operated in a long-line formation are used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes** - potential temporal and spatial overlaps identified.

Titleholder / Operator / Proponent	Activity	Status	Timing	Potential for temporal overlap	Potential for spatial overlap	Project relevant
Western Australian Sea Cucumber Fishery	Hand collection is the main method used in this fishery.	Active	12 month fishing season.	Yes – potential temporal overlap of fishing vessel activities with timings of the Project activities.	Yes – the fishery management area overlaps the Project Operational Area. Refer to Table 3-8 for further information on commercial fisheries in WA State waters.	**Yes**. Potential temporal and spatial overlaps identified.
Commercial Shipping						
Shipping fairways	AMSA shows the closest shipping fairway is ~3 km south of the Operational Area (Section 3.5.2).	Ongoing	All year round.	Yes – potential temporal overlap of shipping activities with timings of the Project activities.	Yes – potential overlapping with underwater sound and light emissions.	**Yes**. Potential temporal and spatial overlaps identified.

6.2.2 Part 2: Identify Relevant Key Environmental Matters

The scoping steps of Part 2 are detailed as follows:

- Step 1: Review Section 5 to identify the planned project aspects of the Project, relevant key environmental matters, and reiterate the acceptable levels of impact for each key environmental matter.
- Step 2: Based on the Project spatial extent, identify potential pathways for cumulative impacts from the Project and other reasonably foreseeable future projects and activities for each key environmental matter (i.e. multiple planned aspects that have spatial overlap with areas of significance for key environmental matters such as BIAs, critical habitat, active fishing cells, petroleum titles).
- Step 3: Based on the indicative project life (2026 to 2031), identify potential pathways for cumulative impacts from the Project and other reasonably foreseeable future projects and activities for each key environmental matter (i.e. multiple planned aspects that have temporal overlap with the presence of key environmental matters present in the Project area).
- Step 4: From the identified spatial and temporal pathways for cumulative impacts, confirm if there is potential for material cumulative cause-effect pathways and the resulting cumulative impacts.
- Step 5: Identify the level of certainty of the scoping assessment data used to define the above factors.
- Step 6: Review the potential of material cumulative impacts and level of certainty for each key environmental matter:
  - If there is potential for material cumulative impacts, the key environmental matter is required to have a detailed CIA.
  - If the certainty of the scoping assessment data does not meet the following points below, the key environmental matter is required to have a detailed cumulative impact assessment:
    - Impacts are well understood
    - Impacts are relatively easy to predict using standard methods
    - Impacts are capable of being mitigated to comply with relevant standards and to meet the acceptable level.

The results of Part 2 scoping assessment are detailed in Table 6-2.

As described in Section 3.6, there is no overlap between the Project Operational Area and any protected and significant areas (world heritage properties, national heritage places, underwater cultural heritage, state marine protected areas, AMPs, wetlands of international importance, KEFs and TECs) in the North-west Shelf region.

As the scoping assessment presented in Table 6-2 did not identify potential cause-effect pathways which could result in material cumulative impacts, a detailed CIA is not required.

Table 6-2: Part 2 - Identification of relevant key environmental matters and detailed CIA scoping

Environmental Component	Key Environmental Matter	Planned Project Aspects									Acceptable Level	Cumulative Impact Scoping: Based on Planned Aspects from the Project and Reasonably Foreseeable Future Projects and Activities				
		Physical presence – interaction with other marine users	Seabed disturbance	Noise emissions – continuous	Noise emissions – impulsive	Atmospheric and GHG emissions	Light emissions	Vessel discharges	Drilling material discharges	Non-drilling material discharges		Potential for cumulative impact – Spatial extent	Potential for cumulative impact – Temporal extent	Material cumulative cause-effect pathway	Level of Certainty of Scoping Assessment	Does the material cumulative impact require detailed assessment?
Physical Environment	Water quality		✓					✓	✓	✓	• Temporary, localised and dispersive. • No serious or irreversible change in water quality.	No - spatial interference is incidental.	No – temporal interference is incidental.	The Project and other reasonably foreseeable projects and activities have the potential to cause temporary and localised change to water quality. Based on the spatial and temporal overlap of the Project with other reasonably foreseeable projects and activities and the localised scale of potential impacts, no material cumulative cause-effect pathways identified.	Impacts are well understood.	**No.** No material cumulative impacts anticipated.
	Air quality					✓					• Temporary, localised and dispersive. • No impact to biodiversity, ecological integrity and social amenity. • No determinable impact to Australia's carbon budget. • Air emissions requirements from vessels within the Operational Area are consistent with Marine Order 97 requirements.	No – minor contribution to GHGs and global climate change.	No - not outside of the framework of the national and domestic emissions reduction targets.	The Project and other reasonably foreseeable project and activities will require fuels and energy that will result in GHG being released into the atmosphere. The cumulative emissions are anticipated to be relatively small in the context of Australian carbon budget and are not expected to have determinable impact. No material cumulative cause-effect pathways identified.	Impacts are capable of being reduced to comply with relevant standards and to meet the acceptable level. GHG emissions assessment conducted.	**No.** No material cumulative impacts anticipated.
Ecological Environment	Benthic habitats		✓						✓	✓	• Temporary and localised. • No serious or irreversible changes to the seabed which may adversely impact on biodiversity or ecological integrity.	No - no critical habitats, sensitive or protected benthic habitat overlap.	Yes – continual presence of benthic habitats.	The Project and other reasonably foreseeable project and activities have the potential result in incidental and localised seabed disturbance. The localised nature of disturbance and the lack of significant benthic habitat and assemblages in the region from Project activities are not anticipated to impact marine ecosystem functioning. Additional impacts from the project and other reasonably foreseeable projects and activities are not expected to result in material cumulative impacts. No material cumulative cause-effect pathways identified.	Impacts are well understood.	**No.** No material cumulative impacts anticipated.

Environmental Component	Key Environmental Matter	Planned Project Aspects									Acceptable Level	Cumulative Impact Scoping: Based on Planned Aspects from the Project and Reasonably Foreseeable Future Projects and Activities				
		Physical presence – interaction with other marine users	Seabed disturbance	Noise emissions – continuous	Noise emissions – impulsive	Atmospheric and GHG emissions	Light emissions	Vessel discharges	Drilling material discharges	Non-drilling material discharges		Potential for cumulative impact – Spatial extent	Potential for cumulative impact – Temporal extent	Material cumulative cause-effect pathway	Level of Certainty of Scoping Assessment	Does the material cumulative impact require detailed assessment?
Ecological Environment	Plankton						✓	✓	✓		• Short-term, temporary, and localised. • No serious or irreversible change in water quality which may adversely impact on biodiversity, ecological integrity, social amenity or human health.	No – no sensitive habitat overlap.	Yes – continual presence of plankton.	The Project and other reasonably foreseeable project and activities have the potential to cause temporary and localised behavioural change to plankton. However, these are not predicted to have ecologically significant effects on planktonic species. Impacts from other reasonably foreseeable projects are predicted to be similar with no material cumulative impacts. No material cumulative cause-effect pathways identified.	Impacts are well understood.	**No.** No material cumulative impacts anticipated.
	Benthic invertebrates		✓		✓			✓		✓	• Temporary and localised. • No serious or irreversible change in water quality which may adversely impact on biodiversity, ecological integrity, social amenity or human health.	No – no critical habitats, sensitive or protected benthic habitat or species overlap.	Yes – continual presence of benthic invertebrates	The Project and other reasonably foreseeable project and activities have the potential to cause temporary behavioural change and injury/mortality to benthic invertebrates. The localised nature of disturbance and the lack of significant benthic habitat and assemblages in the region from Project activities are not anticipated to impact marine ecosystem functioning. Impacts from other reasonably foreseeable projects are predicted to be similar with no material cumulative impacts. No material cumulative cause-effect pathways identified.	Impacts are well understood.	**No.** No material cumulative impacts anticipated.
	Seabirds and shorebirds						✓	✓			• Temporary and localised. • No serious or irreversible harm to a threatened or migratory listed species.	Yes – BIA overlap.	Yes – impact during seasonal presence.	The Project and other reasonably foreseeable project and activities have the potential to cause temporary behavioural change to seabirds and shorebirds. Impacts from other reasonably foreseeable projects are predicted to be similar with no material cumulative impacts. The Project light emissions buffer (20 km from Operational Area) overlaps 1.1% of the breeding BIA for wedge-tailed shearwater in the North-west Marine Region. The BIA is based on a buffer area	Impacts are capable of being mitigated to comply with relevant standards and to meet the acceptable level.	**No.** No material cumulative impacts anticipated.

Environmental Component	Key Environmental Matter	Planned Project Aspects									Acceptable Level	Cumulative Impact Scoping: Based on Planned Aspects from the Project and Reasonably Foreseeable Future Projects and Activities				
		Physical presence – interaction with other marine users	Seabed disturbance	Noise emissions – continuous	Noise emissions – impulsive	Atmospheric and GHG emissions	Light emissions	Vessel discharges	Drilling material discharges	Non-drilling material discharges		Potential for cumulative impact – Spatial extent	Potential for cumulative impact – Temporal extent	Material cumulative cause-effect pathway	Level of Certainty of Scoping Assessment	Does the material cumulative impact require detailed assessment?
														surrounding offshore islands that are used by the species for nesting. Individuals return to the nesting colonies in late June, foraging locally once eggs have hatched. Fledging occurs in the first two weeks of April. Due to the temporary and localised nature of light emissions from the Project activities and other reasonably foreseeable projects and activities, and the small area of overlap, no material cumulative cause-effect pathways identified.		
Ecological Environment	Fish, sharks and rays			✓	✓		✓	✓			• Temporary and localised. • Impacts to marine fauna from noise emissions will be limited to temporary behavioural change localised to the noise source, with no species population-level impacts. • No serious or irreversible change in water quality which may adversely impact on biodiversity or ecological integrity.	Yes – BIA overlap.	Yes – Impact during seasonal presence.	The Project and other reasonably foreseeable project and activities have the potential to cause behavioural change to marine reptiles undertaking biologically important behaviours. The Project light and noise emissions buffers (20 km from Operational Area) overlaps with 0.65% of the foraging BIA for whale shark in the North-west Marine Region. It is known that the whale sharks are more common migrating along the 200 m depth contour, which is further offshore to the Wandoo facility (TSSC, 2015c). Whale sharks aggregate at Ningaloo which is approximately 274 km south-west of the Operational Area between March and July each year to feed. Due to the temporary and localised nature of light and noise emissions from the Project activities and other reasonably foreseeable projects and activities, and the small area of overlap, no material cumulative cause-effect pathways identified.	Impacts are capable of being reduced to comply with relevant standards and to meet the acceptable level.	**No.** No material cumulative impacts anticipated.

Environmental Component	Key Environmental Matter	Planned Project Aspects									Acceptable Level	Cumulative Impact Scoping: Based on Planned Aspects from the Project and Reasonably Foreseeable Future Projects and Activities				
		Physical presence – interaction with other marine users	Seabed disturbance	Noise emissions – continuous	Noise emissions – impulsive	Atmospheric and GHG emissions	Light emissions	Vessel discharges	Drilling material discharges	Non-drilling material discharges		Potential for cumulative impact – Spatial extent	Potential for cumulative impact – Temporal extent	Material cumulative cause-effect pathway	Level of Certainty of Scoping Assessment	Does the material cumulative impact require detailed assessment?
Ecological Environment	Marine mammals			✓	✓						• Short-term, temporary and localised. • Unlikely to result in population level effects. • No serious or irreversible change in water quality which may adversely impact on biodiversity or ecological integrity.	Yes – BIA overlap	Yes – Impact during seasonal presence.	The Project and other reasonably foreseeable project and activities have the potential to cause temporary behavioural change to marine mammals from noise emissions. The Project Operational Area overlaps with a Migration BIA for the humpback whale. The species migrates north through the EMBA from their Antarctic feeding grounds around May each year, reaching the waters of the NWMR in early-June (DoE, 2024b). However, the exact timing of the migration period can vary from year to year. Although, temporary and localised behavioural changes to whale sharks may occur within the Operational Area, these changes are not expected to result in ecologically significant impacts at a population level. No material cumulative cause-effect pathways identified.	Impacts are capable of being reduced to comply with relevant standards and to meet the acceptable level.	**No.** No material cumulative impacts anticipated.
	Marine reptiles			✓	✓		✓				• Temporary and localised • No serious or irreversible change in water quality which may adversely impact on biodiversity or ecological integrity.	Yes – BIA and critical habitat overlap	Yes – Impact during seasonal presence.	The Project and other reasonably foreseeable project and activities have the potential to cause behavioural change to marine reptiles undertaking biologically important behaviours. The Project light emissions buffer (20 km from Operational Area) overlaps with only 1.7% of the internesting BIA for flatback turtle and 2.2% of the habitat critical for flatback turtle in the North-west Marine Region. The Pilbara stock nests throughout the North West Shelf and is characterised by summer nesting (October to March) (CoA, 2017). Due to the temporary and localised nature of light emissions from the Project activities and other reasonably foreseeable projects and activities, no material cumulative cause-effect pathways identified.	Impacts are capable of being reduced to comply with relevant standards and to meet the acceptable level.	**No.** No material cumulative impacts anticipated.

Environmental Component	Key Environmental Matter	Planned Project Aspects									Acceptable Level	Cumulative Impact Scoping: Based on Planned Aspects from the Project and Reasonably Foreseeable Future Projects and Activities				
		Physical presence – interaction with other marine users	Seabed disturbance	Noise emissions – continuous	Noise emissions – impulsive	Atmospheric and GHG emissions	Light emissions	Vessel discharges	Drilling material discharges	Non-drilling material discharges		Potential for cumulative impact – Spatial extent	Potential for cumulative impact – Temporal extent	Material cumulative cause-effect pathway	Level of Certainty of Scoping Assessment	Does the material cumulative impact require detailed assessment?
Social and Economic Environment	Commercial fisheries	✓									• Short-term and temporary. • Undertake the activities in a manner that does not interfere with other marine users to a greater extent than is necessary for the exercise of the rights conferred by the titles granted.	Yes – fishing area overlapping Operational Area.	Yes – impact during seasonal presence	The Project and other reasonably foreseeable oil and gas project and activities have the potential to cause short-term and temporary impacts to fishing operations. Temporary and localised change in fishing operations will not cause material change or result in material cumulative impacts to commercial fisheries. Consultation did not identify any concerns from fishing charter operators within the Project Operational Area. Interactions with fisheries from vessel presence will be of short-term nature to a minor portion of any fishery management area. No material cumulative cause-effect pathways identified.	Impacts are well understood.	**No.** No material cumulative impacts anticipated.
	Shipping	✓									• Short term and localised safety exclusion zone. • Undertake the activities in a manner that does not interfere with other marine users to a greater extent than is necessary for the exercise of the rights conferred by the titles granted.	No - spatial interference is incidental.	No – temporal interference is incidental	The Project and other reasonably foreseeable project and activities have the potential to cause short-term and localised change in shipping movements. Short-term and localised change in shipping routes to avoid the Project and other reasonably foreseeable project and activities will not result in material cumulative impacts to the shipping industry. No material cumulative cause-effect pathways identified.	Impacts are well understood.	**No.** No material cumulative impacts anticipated.
Protected and Significant Areas	Submerged cultural heritage		✓								• No serious or irreversible changes to the seabed which may adversely impact on biodiversity, ecological integrity, social amenity or human health.	No – no spatial overlap with submerged cultural heritage sites.	No – no potential temporal overlap.	The project and other reasonably foreseeable projects and activities will not overlap submerged cultural heritage sites. No material cumulative cause-effect pathways identified.	Impacts are well understood	**No.** No material cumulative impacts anticipated.

Section 7 Environmental Performance Outcomes

Section 21 of the OPGGS(E)R requires an EP to include Environmental Performance Outcomes (EPOs), control measures, Environmental Performance Standards (EPSs) and measurement criteria (Section 4). To ensure environmental performance is maintained to ALARP and acceptable levels, EPOs, control measures, EPSs and measurement criteria have been defined for the activity. EPOs are listed in Table 7-1 and control measures, EPSs and measurement criteria are listed in Table 7-2.

Table 7-1: Environmental Performance Outcomes

Reference	Environmental Performance Outcome
EPO-ED-01	Undertake the activities in a manner that does not interfere with other marine users to a greater extent than is necessary for the exercise of the rights conferred by the titles granted.
EPO-ED-02	No serious or irreversible changes to the seabed which may adversely impact on biodiversity, ecological integrity, social amenity or human health.
EPO-ED-03	Impacts to marine fauna from noise emissions will be limited to temporary behavioural change localised to the noise source, with no species population-level impacts.
EPO-ED-04	Air emissions requirements from vessels within the Operational Area are consistent with Marine Order 97 requirements.
EPO-ED-05	Impacts to marine fauna from light emissions will be limited to temporary behavioural change localised to the light source, with no species population-level impacts.
EPO-ED-06	No serious or irreversible change in water quality which may adversely impact on biodiversity, ecological integrity, social amenity or human health.
EPO-ED-07	No unplanned discharge of waste or objects to the marine environment.
EPO-ED-08	No introduction, establishment or spread of a known or potential introduced marine species.
EPO-ED-09	No injury or mortality to threatened or migratory listed species from vessel collision/strike.
EPO-ED-10	No unplanned discharge of hydrocarbons or chemicals to the marine environment.
EPO-ED-11	Impacts to values and sensitivities are minimised* in the event of a loss of hydrocarbons.

* Reduction of the potential extent of the area affected (based on the worst-case scenarios identified in Section 5.11.2) and/or time and sensitivities exposure.

Table 7-2: Control Measures, Environmental Performance Standards and Measurement Criteria

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-1.1 Functional communication equipment on board MODU and AHTS vessels to communicate with commercial and recreational shipping vessels in the vicinity of the activities.	PS-1.1.1 Communication equipment on board MODU and vessels, shall be functional and maintained in accordance with the contractor's PMS.	MC-1.1.1 VOGA inspection or audit confirms application of contractor's PMS. Communication equipment on board MODU and vessels are included in the contractor's PMS.	EPO-ED-01
CM-1.2 Intent to move MODU to or from field is notified in advance to AMSA.	PS-1.2.1 Notify relevant agency of activities, vessel movements, and requested safety exclusion zone, to enable them to generate radio-navigation warnings and/or Notice to Mariners prior to commencing offshore activities.	MC-1.2.1 Record of lodgement of notification to relevant agency.	EPO-ED-01
CM-1.3 Operational Area has a Petroleum Safety Zone (PSZ) and the MODU has a restricted zone of 500 m for unauthorised vessels.	PS-1.3.1 The restricted zone is limited to a 500 m radius around the MODU.	MC-1.3.1 Record of lodgement of notification to relevant agency.	EPO-ED-01
CM-1.4 Notification of activities direct to relevant persons.	PS-1.4.1 Relevant persons to be identified and notified as appropriate prior to activity, in accordance with Table 9-6.	MC-1.4.1 Record of relevant person assessment and correspondence.	EPO-ED-01
CM-1.5 Vessels to adhere to the navigation safety requirements including the *Navigation Act 2012* and any subsequent Marine Orders.	PS-1.5.1 Vessels compliant with *Navigation Act 2012* and Marine Order 21 (Safety of navigation and emergency procedures) and Marine Order 30 (Prevention of collisions).	MC-1.5.1 Marine assurance inspection records demonstrate compliance with standard maritime safety procedures.	EPO-ED-01

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-2.1 Rig Move Plan will be prepared in general accordance with Drilling Contractor's Marine Operations Manual.	PS-2.1.1 MODU footings will be placed in a controlled fashion according to Rig Move Plan.	MC-2.1.1 Records of MODU operations.	EPO-ED-02
CM-2.2 Unexpected finds of potential underwater cultural heritage sites/features are to be reported.	PS-2.2.1 In the event an underwater cultural heritage site or feature is identified, the Minister will be identified within 21 days through the Australasian Underwater Cultural Heritage Database tool.	MC-2.2.1 Record of relevant person correspondence.	EPO-ED-02
CM-2.3 Positioning technology used to place MODU within the design footprint to reduce seabed disturbance.	PS-2.3.1 The MODU will be pinned directly at each location and will not undergo a soft-pinning exercise, thereby preventing the creation of scour channels in the seabed.	MC-2.3.1 The MODU positioning report confirms direct pinning occurred.	EPO-ED-02
CM-2.4 Conductor will be severed at the seabed post drilling.	PS-2.4.1 All infrastructure removed from the seabed at the end of the campaign, as per Section 572 of the OPGGS Act.	MC-2.4.1 Seabed clearance survey prior to MODU departure.	EPO-ED-02
CM-3.1 MODU and vessel engines and power generation equipment maintained to optimise smooth running.	PS-3.1.1 All MODU and vessel engines and power generation equipment shall be serviced in accordance with the relevant Contractor's PMS to limit excessive noise generation.	MC-3.1.1 VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.	EPO-ED-03

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-3.2 Vessels operating in the Operational Area must adhere to Part 8 of EPBC Regulation 2000 to minimise exposure of marine fauna to noise impacts.	PS-3.2.1 Compliance with EPBC Regulations 2000 – Part 8 Division 8.1 (Regulation 8.05 and 8.06) which requires that: • A vessel will not travel greater than 6 knots within 300 m of a whale (caution zone) and not approach closer than 100 m from a whale • A vessel will not approach closer than 50 m of a dolphin or 100 m of a whale • A vessel will not approach closer than 300 m to a calf (whale or dolphin) (the caution zone) • If a calf appears in the caution zone the vessel must be immediately stopped and must: – Turn off the vessel's engines, or disengage the gears, or withdraw the vessel from the caution zone at a constant speed of less than 6 knots.	MC-3.2.1 Records demonstrate no breaches of EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans.	EPO-ED-03

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-3.3 EPBC Act Policy Statement 2.1 – Interaction between Offshore Seismic Exploration and Whales: Industry Guidelines.	PS-3.3.1 VSP operations will implement precaution zones and management procedures, where practicable: Precaution zones based on modelling results where Rmax for low power zone assessment criteria is within 1 km of source (Warren et al., 2023): • Observation zone: 3 km horizontal radius from the acoustic source. • Low power zone: 2 km horizontal radius from the acoustic source. • Shut-down zone: 500 m horizontal radius from the acoustic source. Following management procedures: • Pre start-up visual observation • Soft start • Start-up delay • Operations • Power-down and stop work.	MC-3.3.1 Records demonstrate no breaches of EPBC Act Policy Statement 2.1 – Interaction between Offshore Seismic Exploration and Whales: Industry Guidelines.	EPO-ED-03
CM-4.1 The sulphur content of fuel complies with Regulation 14 of MARPOL 73/78 Annex IV and AMSA Marine Order 97.	PS-4.1.1 Fuel purchased in Australia shall meet Australian standards.	MC-4.1.1 Records of low sulphur fuel usage.	EPO-ED-04

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-4.2 MODU and AHTS Vessels comply with Regulation 14 of MARPOL 73/78 Annex VI and AMSA Marine Order Part 97.	PS-4.2.1 Marine diesel engines meet NOx emission requirements and limits as set out by MARPOL 73/78, Annex VI, Regulation 13, and have an IAPP certificate. Onboard incinerators (if present) will meet IMO standards and are identified in the vessels' IAPP certificate. Equipment and systems that contain ODS comply with MARPOL 73/78, Annex VI, Regulation 12, are identified in the vessels' IAPP certificate and an ODS record book is maintained (where applicable). Vessels >400 GT have a SEEMP.	MC-4.2.1 Vessel IAPP certificate. ODS Record Book. Records of SEEMP.	EPO-ED-04
CM-4.3 Contractor PMS in place to maintain power generation systems and ancillary diesel engines.	PS-4.3.1 All MODU and vessel engines and power generation equipment shall be serviced in accordance with the relevant Contractor's PMS. Contractor's servicing and maintenance records shall be validated by VOGA to ensure they are up to date.	MC-4.3.1 VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.	EPO-ED-04

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-4.4 Contractor PMS in place to maintain refrigeration systems within the use of ODS.	PS-4.4.1 Refrigeration systems shall be maintained in accordance with contractor's PMS to ensure refrigerant emissions are minimised. Contractor's servicing and maintenance records shall be validated by VOGA to ensure they are up to date.	MC-4.4.1 VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.	EPO-ED-04
CM-5.1 Lighting will be limited to the minimum required for navigational and safety requirements, with the exception of emergency events.	PS-5.1.1 Reduce unnecessary MODU and vessel lighting to only those required for safe work and navigational use, in accordance with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c).	MC-5.1.1 Inspection and memo verifies no excessive light usage.	EPO-ED-05
CM-6.1 Chemical assessment and selection process.	PS-6.1.1 Chemicals that will be discharged to the marine environment are selected in accordance with VOGA's Chemical Assessment Process (Section 8.3.7).	MC-6.1.1 Completed chemical assessments show chemicals discharged to the marine environment meet the criteria of VOGA's Chemical Assessment Process (Section 8.3.7).	EPO-ED-06

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-6.2 Engines on board the MODU and support vessels are to be maintained in accordance with the manufacturer's specifications.	PS-6.2.1 All MODU and vessel engines and power generation equipment shall be serviced in accordance with the relevant contractor's PMS. Contractor's servicing and maintenance records shall be validated by VOGA to ensure they are up to date.	MC-6.2.1 VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.	EPO-ED-06

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-6.3 MODU and support vessels are required to comply with MARPOL 73/78 Annex I, Annex IV, Annex V, and AMSA Marine Orders 91 and 96.	PS-6.3.1 Vessel contractor procedures include the requirements to comply with MARPOL 73/78 (Annex IV; Regulation 8) as required by class: • equipped with either a sewage treatment plant or sewage comminuting and disinfecting system or a sewage holding tank • wastes shall be macerated to <25 mm prior to discharge • untreated sewage will be stored on-board in suitable holding tanks and disposed of onshore at reception facility or to carrier licenced to receive the waste or discharged at a distance of more than 12 nm from the nearest land. Vessel contractor procedures include the requirements to comply with MARPOL 73/78 (Annex I; Regulation 15) as required by class: • deck drainage and bilge water will be treated in an oil water separator and discharged.	MC-6.3.1 Vessel international Sewage Pollution Prevention Certificate.	EPO-ED-06
CM-6.4 Solids Control System used to remove cuttings from drilling fluids in order to keep fluids in specification for reuse.	PS-6.4.1 Volumes of drill fluids discharged will be minimised through the use of solids control equipment.	MC-6.4.1 Records confirm solids control equipment is used and discharge volumes are tracked.	EPO-ED-06

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-6.5 Only WBM used for drilling, rather than synthetic-based muds.	PS-6.5.1 The contractor ensures only WBM are used during the drilling activities.	MC-6.5.1 Records confirm only WBM has been used.	EPO-ED-06
CM-6.6 Unused bulk product managed as per Figure 2-2 at end of campaign	PS-6.6.1 Unused bulk product managed as per Figure 2-2 at end of campaign.	MC-6.6.1 Records demonstrate that the process outlined in Figure 2-2 was followed for the management of unused bulk product.	EPO-ED-06
CM-6.7 Quality control for barite.	PS-6.7.1 Contaminant limit concentrations in barite: • Mercury (Hg) – 1 mg/kg dry weight in stock barite • Cadmium (Cd) – 3 mg/kg dry weight in stock barite.	MC-6.7.1 Records show barite used for the drilling meets the below standard: • Mercury (Hg) – 1 mg/kg dry weight in stock barite • Cadmium (Cd) – 3 mg/kg dry weight in stock barite.	EPO-ED-06
CM-6.8 Monitoring use of barite and cement.	PS-6.8.1 Use of barite and cement will be monitored to reduce excess of bulk products remaining at end of campaign.	MC-6.8.1 Records confirm that the use of barite and cement were monitored, and excess of bulk products were reduced to the minimum required.	EPO-ED-06

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-6.9 Industry collaboration on management of unused bulk products.	PS-6.9.1 VOGA will: • continue to be involved in industry collaboration efforts relating to the management of unused bulk products • implement improvements identified through industry-wide collaboration efforts if deemed ALARP following decision framework in Figure 2-2.	MC-6.9.1 Records demonstrate VOGA is involved in industry collaboration efforts and any improvements are implemented, if determined to be ALARP, following the decision framework in Figure 2-2.	EPO-ED-06
CM-7.1 Non-hazardous and hazardous wastes are managed in accordance with contractor's Waste Management Plan.	PS-7.1.1 Hazardous and non-hazardous wastes shall be segregated into recyclable and non-recyclable in accordance with the vessel Waste Management Plan.	MC-7.1.1 VOGA audit or inspection confirms hazardous and non-hazardous wastes are segregated into recyclable and non-recyclable wastes. Compliance records from VOGA's waste management audit.	EPO-ED-07
	PS-7.1.2 Waste shall be stored in clearly marked containers, and hazardous wastes bunded, in accordance with the relevant Safety Data Sheet (SDS) and the vessel Waste Management Plan.	MC-7.1.2 VOGA inspection or audit confirms compliance.	EPO-ED-07
	PS-7.1.3 Wastes for onshore disposal shall be transported in suitable containers as outlined in the vessel Waste Management Plan.	MC-7.1.3 Inspection or audit confirms waste is transported onshore in relevant containers.	EPO-ED-07

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
	PS-7.1.4 All non-hazardous (except putrescible waste and waste-water) and hazardous waste shall be transported to shore and disposed of in appropriately licensed facilities in accordance with the vessel Waste Management Plan.	MC-7.1.4 Waste disposal receipts confirm appropriate disposal of wastes (type and volume).	EPO-ED-07
CM-7.2 MODU and vessel inductions include control measures and training for crew in dropped object prevention.	PS-7.2.1 Crew training/inductions, and job safety analyses where relevant, will include a component on preventing dropped objects to increase awareness of requirements in accordance with Section 8.3.6.	MC-7.2.1 Records show training to minimise the potential for dropped objects is provided to the MODU and vessel(s) crew.	EPO-ED-07
CM-7.3 MODU and vessel procedures are compliant with MARPOL Convention Annex V, Prevention of Pollution by Garbage from Ships and Marine Orders 95.	PS-7.3.1 All vessels licensed to carry more than 15 persons or over 400 gross tonnage shall have and implement a Waste Management Plan and maintain a Garbage Record Book in accordance with MARPOL Convention Annex V, Prevention of Pollution by Garbage from Ships and Marine Order 95.	MC-7.3.1 VOGA inspection or audit of MODU and vessels to ensure compliance with Waste Management Plan. Garbage Record Book details the wastes (type and volume) disposed.	EPO-ED-07

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-7.4 MODU work procedures for lifts, bulk transfers and cargo loading.	PS-7.4.1 MODU work procedures require: • The security of loads to be checked prior to commencing lifts • Loads to be covered if there is a risk of losing loose materials • Lifting operations to be conducted using systems to manage the specific risks of that lift, including consideration of weather and sea state.	MC-7.4.1 Completed handling and transfer procedure checklist, Permit to Work and/or risk assessments verify that the procedure is implemented prior to each transfer.	EPO-ED-07
CM-7.5 Recovery of dropped objects where practical to do so.	PS-7.5.1 Any hazardous solid waste dropped to the marine environment will be recovered where safe and practicable to do so. Where safe and practicable for this activity, consider: • Risk to personnel to retrieve object • Whether the location of the object is in recoverable water depths • The object's proximity to subsea infrastructure • Ability to recover the object (i.e. nature of object, lifting equipment or ROV availability, and suitable weather).	MC-7.5.1 Incident reports detail the recovery attempt consideration and status of any hazardous waste lost to the marine environment.	EPO-ED-07

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-8.1 Australian Ballast Water Management Requirements (DAWE, 2020) consistent with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Management Convention) (IMO, 2004).	PS-8.1.1 Vessels will have an approved ballast water management plan and valid ballast water management certificate, unless an exemption applies or is obtained, as specified in the Australian Ballast Water Management Requirements.	MC-8.1.1 Ballast water management plan or record of exemption. Valid ballast management certificate or record of exemption.	EPO-ED-08
CM-8.2 MODU and Vessels comply with the Annex 1 of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships.	PS-8.2.1 Anti-fouling systems on the MODU and support vessels are maintained in compliance with International Convention on the Control of Harmful Anti-Fouling Systems on Ships (IMO, 2001): • Prohibits the use of harmful organotins in antifouling paints used on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.	MC-8.2.1 Records indicate MODU and vessel anti-fouling systems have not used harmful organotins.	EPO-ED-08

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-8.3 MODU, vessel and immersible equipment complete the VOGA Biofouling Risk Assessment Process consistent with National Biofouling Guidelines for the Petroleum Production and Exploration Industry and IMO Guidelines for the control and management of a ships' biofouling to minimise the transfer of IMS.	PS-8.3.1 MODU and support vessels will complete a VOGA Biofouling Risk Assessment, identifying a low risk before mobilisation to the Operational Area. Biofouling risk based on a range of information including presence of a biofouling management plan and record book, last port of call, age of anti-fouling coating, etc. If a risk category of moderate, uncertain or high is scored, the process requires an independent IMS expert to be engaged and further risk assessment and/or management measures undertaken.	MC-8.3.1 Records of VOGA Biofouling Risk Assessments maintained for MODU and support vessels and relevant immersible equipment entering the Operational Area demonstrating low risk status. Records of management measures implemented if required, through the IMS vessel risk assessment process.	EPO-ED-08

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-9.1 Vessels contracted by VOGA operating in the Operational Area must adhere to Part 8 of EPBC Regulation 2000 to minimise exposure of marine mammals.	PS-9.1.1 Compliance with EPBC Regulations 2000 – Part 8 Division 8.1 (Regulation 8.05 and 8.06) which requires that: • A vessel will not travel greater than 6 knots within 300 m of a whale (caution zone) and not approach closer than 100 m from a whale. • A vessel will not approach closer than 50 m of a dolphin or 100 m of a whale (with the exception of animals bow-riding). • A vessel will not approach closer than 300 m to a calf (whale or dolphin) (the caution zone) • If a calf appears in the caution zone the vessel must be immediately stopped and must: turn off the vessel's engines, or disengage the gears, or withdraw the vessel from the caution zone at a constant speed of less than 6 knots.	MC-9.1.1 Records demonstrate no breaches of EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans.	EPO-ED-09
CM-9.2 Vessels contracted by VOGA operating in the Operational Area must adhere to separation distances defined by the Biodiversity Conservation Regulations 2018 (WA) to minimise exposure of marine fauna.	PS-9.2.1 Compliance with Biodiversity Conservation Regulations 2018 (WA) which requires that: a vessel will maintain a separation distance of 30 m from a whale shark.	MC-9.2.1 Records demonstrate no breaches of the separation distances defined for whale sharks with the Biodiversity Conservation Regulations 2018 (WA).	EPO-ED-09

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-9.3 Environmental induction.	PS-9.3.1 Crew training/inductions will include a component on interacting with marine fauna, with reference to: • Part 8 of the EPBC Regulations Separation distance for the whale shark within the Biodiversity Conservation Regulations.	MC-9.3.1 Attendance records from training.	EPO-ED-09
CM-10.1 Helicopter refuelling on the MODU is not planned while it is jacked up on location in the Operational Area.	PS-10.1.1 No helicopter refuelling on the MODU or vessels in the Operational Area.	MC-10.1.1 MODU and vessel log books confirm no helicopter refuelling occurred.	EPO-ED-10
CM-10.2 Chemical storage on MODU and vessels compliant with MODU and vessel contractor's storage requirements to prevent release to marine environment.	PS-10.2.1 All hazardous chemicals shall be stored in bunded areas or below deck to prevent release to marine environment	MC-10.2.1 VOGA inspection or audit process confirms chemical storage will prevent release of chemicals to the marine environment.	EPO-ED-10
CM-10.3 Contractor's PMS includes hydraulic hose maintenance and replacement schedule.	PS-10.3.1 All hydraulic hoses shall be serviced in accordance with the relevant Contractor's PMS and replacement schedule. Contractor's servicing and maintenance records shall be validated by VOGA to ensure they are up to date.	MC-10.3.1 VOGA inspection or audit confirms application of contractor's PMS during MODU pre-hire inspection.	EPO-ED-10

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-10.4 Contractor's PMS includes all MODU and AHTS hydraulic hose, vessel lifting equipment and cranes maintenance and replacement schedule.	PS-10.4.1 All MODU and AHTS hydraulic hoses, vessel lifting equipment and cranes shall be serviced and certified in accordance with the relevant Contractor's PMS. Contractor's servicing and maintenance records shall be validated by VOGA to ensure they are up to date.	MC-10.4.1 VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date.	EPO-ED-10
CM-10.5 Notification of activities direct to relevant persons.	PS-10.5.1 Relevant persons to be identified and notified as appropriate prior to activity.	MC-10.5.1 Record of relevant person assessment and correspondence.	EPO-ED-10
CM-10.6 Navigational lights on vessels and MODU.	PS-10.6.1 Vessel and MODU navigation lighting shall comply with SOLAS and the *Navigation Act 2012*.	MC-10.6.1 VOGA inspection or audit confirms lighting complies with SOLAS and the *Navigation Act 2012*.	EPO-ED-10
CM-10.7 Vessels shall be DP capable.	PS-10.7.1 Vessel contract specifies DP-capable vessels.	MC-10.7.1 VOGA inspection or audit confirms vessels are DP capable.	EPO-ED-10
CM-10.8 Vessels perform DP trials as required by their PMS.	PS-10.8.1 Vessels are required to conduct DP trials prior to entry into the 500 m restricted zone.	MC-10.8.1 DP trials noted in ships log.	EPO-ED-10
CM-10.9 SIMOPS Plan defines controls to be implemented when multiple vessels are in field.	PS-10.9.1 SIMOPS Plan shall define controls to be implemented when multiple vessels are in field.	MC-10.9.1 SIMOPS Plan implemented. Audit records to confirm compliance.	EPO-ED-10

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-10.10 Vessels contracted by VOGA have certified masters.	PS-10.10.1 VOGA shall validate that vessel masters meet requirements of their company's CMS.	MC-10.10.1 Review of contractors CMS.	EPO-ED-10
CM-10.11 Vessels contracted by VOGA have systems to assist with tracking and identifying vessels in the general area.	PS-10.11.1 VOGA shall validate that vessels are fitted with radar and AIS.	MC-10.11.1 VOGA inspection or audit confirms presence of working radar equipment.	EPO-ED-10
CM-10.12 Breakaway coupling on refuelling hose to prevent spill due to vessel loss of position.	PS-10.12.1 Breakaway coupling is required to be installed on refuelling hoses.	MC-10.12.1 Pre-hire inspection confirms presence of equipment.	EPO-ED-10
CM-10.13 Contractor bunkering equipment requirements: • Contractor's PMS includes bulk transfer hose maintenance and replacement schedule to ensure current certification and hoses are in good condition. • Fuel hoses have dry-break couplings and floatation. • Adequate number of appropriately stocked, located and maintained spill kits.	PS-10.13.1 • All transfer hoses shall be maintained and confirmed currently certified in accordance with the relevant Contractor's PMS. • VOGA shall validate Contractor's fuel hoses will have dry-break couplings and floatation. • VOGA shall validate the presence of adequate number of appropriately stocked, located and maintained spill kits in accordance with vessel SOPEP/SMPEP (equivalent to class).	MC-10.13.1 • VOGA inspection or audit confirms application of contractor's PMS. Contractor's servicing and maintenance records are up to date. • VOGA inspection confirms Contractor's fuel hoses have dry-break couplings and floatation. • VOGA inspection confirms presence of adequate number of appropriately stocked, located and maintained spill kits in accordance with vessel SOPEP/SMPEP (equivalent to class).	EPO-ED-10

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-10.14 Contractor bunkering procedure includes: • Check hoses prior to bunkering. • Monitoring of gauges, hoses, fittings and sea surface during bunkering. • Bunkering only in daylight hours. • No bunkering in marginal weather conditions.	PS-10.14.1 Vessels compliant with Contractor bunkering procedure for the prevention of collisions and accidental release of MDO.	MC-10.14.1 Records demonstrate bunkering operations undertaken in accordance with Contractor bunkering procedure.	EPO-ED-10
CM-10.15 Wells are designed in compliance with the VOGA Well Construction Standards Manual (WCSM) [VOG-5000-MN-003].	PS-10.15.1 Well design shall comply with standards described in VOGA's WCSM.	MC-10.15.1 Statement in Basis of Well Design document.	EPO-ED-10
CM-10.16 VOGA standards require that casing and completion and wellhead components are manufactured to relevant API or ISO specifications.	PS-10.16.1 VOGA shall validate that well casing, completion and wellhead components are manufactured to relevant API specifications.	MC-10.16.1 Purchase orders and contracts specify manufacturing standards.	EPO-ED-10
CM-10.17 VOGA selects contractors based on evaluation of their ability to provide fit-for-purpose services in support of an exploration campaign.	PS-10.17.1 The drilling exploration contractor used on a campaign shall be assessed through VOGA's contractor evaluation process or equivalent.	MC-10.17.1 Records of contractor evaluation process.	EPO-ED-10
CM-10.18 VOGA standards require that all activities on a well after initial installation of a BOP require a minimum of two temporary barriers be in place unless exempted through a formal Management of Change (MoC) process.	PS-10.18.1 Drilling Program shall specify the barriers to be in place during well operations.	MC-10.18.1 Drilling Program signed off by VOGA Well Construction Manager.	EPO-ED-10

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-10.19 VOGA conduct Peer Review and Drill Well on Paper workshops to review well designs and operational plans.	PS-10.19.1 VOGA shall conduct Peer Review and Drill Well on Paper workshops to review well designs and operational plans.	MC-10.19.1 Peer Review and Drill Well on Paper attendance records.	EPO-ED-10
CM-10.20 VOGA prepares a detailed program for each well activity to outline the intended work scope and the well barriers to be in place during the campaign.	PS-10.20.1 Drilling Program shall outline the intended work scope and well barriers to be in place during the campaign.	MC-10.20.1 Drilling Program signed off by VOGA Well Construction Manager.	EPO-ED-10
CM-10.21 VOGA Drilling Supervisors, Completions Supervisors and Drilling Superintendents are required to hold current Well Control certification.	PS-10.21.1 VOGA Drilling Supervisors, Completions Supervisors and Drilling Superintendents shall hold current well control certification as required.	MC-10.21.1 Drilling Superintendent confirms currency prior to operations commencing Certification records kept on file.	EPO-ED-10
CM-10.22 VOGA require the MODU Contractor to ensure that drilling personnel with a position of derrickman and above to hold well control certification.	PS-10.22.1 Relevant MODU personnel shall hold current well control certification as required.	MC-10.22.1 Certification kept on file by MODU Contractor. Drilling Superintendent confirms currency prior to operations commencing.	EPO-ED-10
CM-10.23 VOGA require a Barrier Verification Document to be completed prior to progressing beyond programmed check points in a Drilling Program.	PS-10.23.1 VOGA Barrier Verification Document shall be completed and signed off by senior VOGA and Drilling Contractor representatives prior to progressing beyond the programmed check points in a Drilling Program.	MC-10.23.1 Signed Barrier Verification Document.	EPO-ED-10

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-10.24 VOGA require that BOPs are tested at regular intervals in accordance with API standard 53.	PS-10.24.1 VOGA shall validate that BOPs are tested at regular intervals in accordance with API standard 53 in accordance with VOGA requirements.	MC-10.24.1 Tests noted in Daily Drilling Report.	EPO-ED-10
CM-10.25 Formation Integrity Tests (FITs) or Leak Off Tests (LOTs) are conducted after drilling out casing shoes or milling windows in existing casing if required under the WCSM.	PS-10.25.1 LOTs or FITs shall be conducted after drilling out casing shoes or milling windows in existing casing when programmed.	MC-10.25.1 LOT or FIT report.	EPO-ED-10
CM-10.26 VOGA requires kick tolerances to be calculated for all pressure containing casing strings.	PS-10.26.1 Kick tolerance shall be calculated for all pressure containing casing strings in accordance with requirements of WCMS and Drilling Program.	MC-10.26.1 Kick tolerance noted in Daily Drilling Report if kick tolerance calculations are required during drilling activities.	EPO-ED-10
CM-10.27 VOGA requires the Drilling Contractor and the mud logging service provider to independently monitor mud flows for variances.	PS-10.27.1 VOGA shall validate that the Drilling Contractor and the mud logging service provider monitor mud flows.	MC-10.27.1 Daily mud reports.	EPO-ED-10
CM-10.28 VOGA require drilling contractor to conduct drills demonstrating preparedness to act if unexpected mud flows occur.	PS-10.28.1 VOGA shall validate that kick and choke drills conducted.	MC-10.28.1 Drills noted in Daily Drilling Report.	EPO-ED-10
CM-11.1 MODU and vessels will implement a SOPEP/SMPEP in the event of a spill.	PS-11.1.1 SOPEP/SMPEP (equivalent to class) procedures shall be available during drilling activities.	MC-11.1.1 VOGA inspection or audit confirms SOPEP/SMPEP (equivalent to class) procedures are available on the vessels during drilling activities.	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-11.2 MODU and vessels have equipment to manage small deck spills.	PS-11.2.1 Equipment meeting the requirements of the SOPEP/ SMPEP (equivalent to class) shall be available on the vessels during drilling activities.	MC-11.2.1 VOGA inspection or audit confirms appropriate spill kits are available during drilling activities.	EPO-ED-11
CM-11.3 The NOPSEMA-accepted OPEP will be implemented in the event of any diesel spill to the marine environment.	PS-11.3.1 Oil spill response strategies shall be implemented in accordance with the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	MC-11.3.1 IAP records.	EPO-ED-11
CM-11.4 The NOPSEMA-accepted OSMP will be implemented in the event of any diesel spill to the marine environment.	PS-11.4.1 Oil spill operational and scientific monitoring shall be implemented in accordance with the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	MC-11.4.1 IAP records.	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-11.5 Decision making processes support mitigation of environmental impact of spills and assessment of effectiveness of response strategies.	PS-11.5.1 The Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] shall provide a process for completing an IAP which shall include: • An environmental impact assessment of the proposed response activities • Selection of the most appropriate response activities (strategies) • Identification of appropriate operational and scientific monitoring activities • Operational and scientific monitoring outputs shall inform the effectiveness of response strategies.	MC-11.5.1 Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-11.6 The Wandoo Field OSCP describes incident management system and interfaces.	PS-11.6.1 • Organisational structure and roles and responsibilities of Incident Control Team (ICT) members are defined in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016]. • Interfaces between the VOGA ICT and the command teams representing State and Commonwealth Oil Spill Response Agencies are described in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	MC-11.6.1 Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	EPO-ED-11
CM-11.7 Limit the fuel volume on vessels to ensure modelled worst case MDO spill scenario from vessel collision cannot be exceeded.	PS-11.7.1 Vessels will have a maximum bunkering volume of 300 m^3 for a single fuel tank.	MC-11.7.1 Fuel bunkering records and/or relevant purchase records.	EPO-ED-11
CM-11.8 The NOPSEMA-accepted Source Control Emergency Response Plan (SCERP) will be implemented in the event of a LOWC.	PS-11.8.1 SCERP reviewed prior to exploration activities for any well capable of sustaining flow to surface. This includes an assessment of flow rate and duration using reservoir simulation modelling. If the assessment indicates potential for worst case discharge parameters to be exceeded, the MoC process will be undertaken in accordance with Section 8.5.	MC-11.8.1 NOPSEMA-accepted SCERP. Review records. Reservoir modelling records. MoC records.	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
	PS-11.8.2 Source control response strategies shall be implemented in accordance with the SCERP.	MC-11.8.2 IAP records.	
	PS-11.8.3 Suitable rigs for relief well operations are identified at the time of reviewing the SCERP, and VOGA tracks MODU activity within the region and updates the register on monthly basis during drilling activities for any well capable of sustaining flow to surface.	MC-11.8.3 Relief well rig availability register records.	
CM-11.9 The NOPSEMA-accepted Oil Pollution Emergency Plan (OPEP) will be implemented in the event of a LOWC.	PS-11.9.1 Oil spill response strategies shall be implemented in accordance with the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	MC-11.9.1 IAP records.	EPO-ED-11
CM-11.10 The NOPSEMA-accepted Operational and Scientific Monitoring Plan (OSMP) will be implemented in the event of a LOWC.	PS-11.10.1 Oil spill operational and scientific monitoring shall be implemented in accordance with the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].	MC-11.10.1 IAP records.	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-11.11 Ensure the most effective response strategies are being applied and environmental impact of the spill and response strategies are measured.	PS-11.11.1 • Monitoring shall be activated from time of spill detection to inform implementation of response strategies. • Preliminary Oil Spill Trajectory Modelling (OSTM) to be requested within 3 hours of a spill being reported. • Satellite tracking buoys to be deployed within 30 minutes of a spill being reported. • Environmental data to support decision making (IAP) and spill impact assessment shall be available prior to impact.	MC-11.11.1 IAP records.	EPO-ED-11
CM-11.12 Application of chemical dispersant in accordance with the dispersant application zone.	PS-11.12.1 Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application (Appendix I).	MC-110.12.1 Assurance activities, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application.	EPO-ED-11
CM-11.13 Application of mechanical dispersant activities in accordance with application zones.	PS-11.13.1 Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-03 - Response strategy - Mechanical dispersant application (Appendix I).	MC-11.13.1 Assurance activities, as per WAN-WNAB-CP-ER-03-03 - Response strategy - Mechanical dispersant application.	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-11.14 Oil spill response personnel understand and competently perform their response roles.	PS-11.14.1 Performance criteria shall apply, as per WAN-WNAB-CP-ER-01-05 - Arrangements are understood (Appendix I).	MC-11.14.1 Assurance activities, as per WAN-WNAB-CP-ER-01-05 - Arrangements are understood.	EPO-ED-11
CM-11.15 Increase the rate of biodegradation to reduce the environmental impact from surface oil and oil stranding on shoreline sensitivities.	PS-11.15.1 Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application (Appendix I).	MC-11.15.1 Assurance activities, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application.	EPO-ED-11
CM-11.16 Minimise environmental impacts associated with dispersant application.	PS-11.16.1 Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application (Appendix I).	MC-11.16.1 Assurance activities, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application.	EPO-ED-11
CM-11.17 Minimise potential impacts on fauna caused by oiled wildlife response activities.	PS-11.17.1 Induction and training shall cover any special handling requirements to minimise further detrimental impacts to flora and fauna.	MC-11.17.1 Induction material. IAP records.	EPO-ED-11
	PS-11.17.2 Wildlife strategy including hazing, if required, shall be developed in consultation with the Department of Transport.	MC-11.17.2 IAP records.	

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-110.18 Minimise and mitigate the number of wildlife oiled following a spill.	PS-110.18.1 Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-07 - Response strategy - Oiled wildlife response (Appendix I).	MC-110.18.1 Assurance activities, as per WAN-WNAB-CP-ER-03-07 - Response strategy - Oiled wildlife response (Appendix I).	EPO-ED-110
CM-11.19 Deployment of equipment will be undertaken by trained incident response personnel.	PS-11.19.1 Performance criteria shall apply, as per: • WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery • WAN-WNAB- CP-ER-03-04- Response strategy –Protection and deflection • WAN-WNAB- CP-ER-03-06- Response strategy – Shoreline clean-up (Appendix I).	MC-11.19.1 Assurance activities, as per: • WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery • WAN-WNAB- CP-ER-03-05- Response strategy –Protection and deflection and • WAN-WNAB- CP-ER-03-06- Response strategy – Shoreline clean-up.	EPO-ED-11
CM-11.20 Reduce overall volume of surface oil to minimise impacts to environmental sensitivities.	PS-11.20.1 Performance criteria shall apply, as per WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery (Appendix I).	MC-11.20.1 Assurance activities, as per WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery.	EPO-ED-11
CM-11.21 Minimise environmental impacts to priority near-shore environmental sensitivities by reducing oil contact.	PS-11.21.1 Performance criteria shall apply as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection (Appendix I).	MC-11.21.1 Assurance activities, as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection.	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-11.22 Minimise environmental impacts associated with improperly deployed equipment.	PS-11.22.1 Performance criteria shall apply as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection (Appendix I).	MC-11.221.1 Assurance activities, as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection.	EPO-ED-11
CM-110.23 Minimise impact to fauna from oil spill response activities.	PS-110.23.1 Performance criteria shall apply as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection (Appendix I).	MC-110.23.1 Assurance activities, as per WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection.	EPO-ED-110
CM-11.24 Remove stranded hydrocarbons from shorelines without causing greater environmental impact than leaving the hydrocarbons in-situ.	PS-11.24.1 Assurance activities, as per WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up (Appendix I).	MC-11.24.1 Assurance activities, as per WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up.	EPO-ED-11
CM-11.25 Minimise impact to key shoreline habitats associated with shoreline clean-up activities.	PS-11.25.1 Assurance activities, as per WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up (Appendix I).	MC-11.25.1 Assurance activities, as per WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up.	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-11.26 Minimise environmental impacts associated with improperly deployed equipment.	PS-11.26.1 Performance criteria shall apply, as per: • WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery • WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection (Appendix I).	MC-11.26.1 Assurance activities, as per: • WAN-WNAB-CP-ER-03-04 - Response strategy - Containment and recovery • WAN-WNAB-CP-ER-03-06 - Response strategy – Shoreline clean-up • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection.	EPO-ED-11
CM-11.27 Booms shall only be installed after consultation and approval from the Department of Transport.	PS-11.27.1 Performance criteria shall apply, as per: • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection • WAN-WNAB-CP-ER-03-06- Response strategy – Shoreline clean-up (Appendix I).	MC-11.27.1 Assurance activities, as per: • WAN-WNAB-CPER-03-05 - Response strategy – Protection and deflection • WAN-WNAB- CP-ER-03-06- Response strategy – Shoreline clean-up.	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-11.28 Shoreline assessments will be used to select appropriate shoreline clean-up techniques.	PS-11.28.1 Performance criteria shall apply, as per: • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection • WAN-WNAB- CP-ER-03-06 - Response strategy – Shoreline clean-up (Appendix I).	MC-11.28.1 Assurance activities, as per: • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection • WAN-WNAB- CP-ER-03-06 - Response strategy – Shoreline clean-up.	EPO-ED-11
CM-11.29 Environmental monitoring of impact of the spill and response strategies.	PS-11.29.1 The Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] shall be implemented inclusive of an environmental monitoring plan which considers: • Environmental impact associated with the spill and response strategies • Environmental sensitivities to be monitored • Monitoring methods and type • Sources of baseline data • Resources required and mobilisation times • Termination criteria.	MC-11.29.1 Results from environmental monitoring plan are available for IAP.	EPO-ED-11

Control Measure	Environmental Performance Standard	Measurement Criteria	EPO Reference (Table 7-1)
CM-11.30 Current oil spill response arrangements are accessible to all personnel in the event of an oil spill.	PS-11.30.1 Oil spill response documentation is up to date, maintained and readily available within VOGA Information Systems.	MC-11.30.1 HSE MS audits of Element 8 are conducted in accordance with the HSEMS Element 12 – Performance Assurance Manual [VOG-1100-YG-1201.02].	EPO-ED-11
CM-11.31 Establish demarcation zones for vehicle and personnel movement considering sensitive vegetation, bird nesting and roosting areas and turtle nesting habitat.	PS-11.31.1 Performance criteria shall apply, as per: • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection • WAN-WNAB- CP-ER-03-06 - Response strategy – Shoreline clean-up (Appendix I).	MC-11.31.1 Assurance activities, as per: • WAN-WNAB-CP-ER-03-05 - Response strategy – Protection and deflection • WAN-WNAB- CP-ER-03-06 - Response strategy – Shoreline clean-up.	EPO-ED-11

Section 8 Implementation Strategy

8.1 Overview

The primary goals of the implementation strategy is to direct, review and manage operations activities so that environmental impacts and risks are continually being managed to ALARP, and to ensure that performance outcomes and performance standards are being met over the life of the project activities.

The VOGA HSE Management System (HSE MS) provides the procedures and practices that will be followed to ensure environmental risks of operations are reduced to ALARP.

The following approaches are used to ensure VOGA's HSE MS, practices and procedures are implemented:

- Activities will be undertaken in accordance with VOGA's HSE MS (Section 8.2)
- Activities will be undertaken in accordance with VOGA's HSE Policy (Appendix A)
- Activities will be assessed in accordance with the VOGA Risk Management Manual [VOG-2000-MN-0001] (Section 4)
- Contractors are managed (Section 8.3.4)
- Roles and responsibilities are outlined (Section 8.3.5)
- Training and competency are outlined (Section 8.3.6)
- Chemicals used in offshore applications are appropriately managed (Section 8.3.7)
- A biofouling risk assessment process is in place and implemented (Section 8.3.8)
- Performance outcomes, standards and measurement criteria are implemented (Section 8.4)
- Opportunities for continual improvement are identified (Section 8.3.10)
- Emergency Response Plans (ERPs) are in place (Section 8.7)
- Oil pollution response arrangements are in place and regularly tested (Section 8.8)
- Monitoring and review are undertaken, including inspection and assurance plan developed and implemented (Section 8.9)
- Environmental performance reporting is undertaken (8.10).

8.2 HSE Management System

8.2.1 Overview

The HSE MS provides the procedures and practices that will be followed to ensure that the environmental risks associated with its activities are reduced to ALARP.

The HSE MS has been developed to be consistent with the requirements of the following standards:

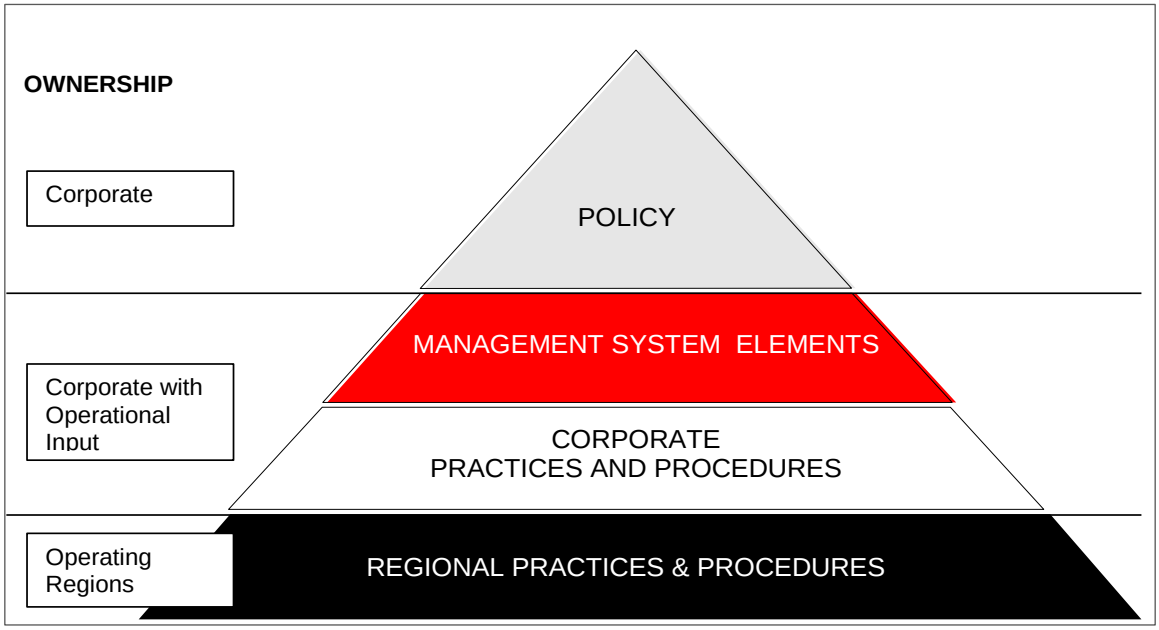
- ISO 14001: Environmental Management System
- OHSAS 18002:2000 Occupational Health & Safety Management Systems (an international standard equivalent to AS/NZS 4801)
- API 9100 Model Environmental, Health and Safety Management System.

HSE MS is also consistent with AS/NZS 4360:2004 Risk Management although it has not been developed specifically to meet that standard.

8.2.2 Structure

The following section describes the structure of the HSE MS, how it integrates top level management through to activities on the facilities, and how the elements of the HSE MS are linked in a logical manner to all activities. The overall HSE MS documentation hierarchy is illustrated in Figure 8-1.

Figure 8-1: HSE MS framework



8.2.3 HSE Policy

The VOGA HSE Policy applies to all VOGA activities. The written policy statement provides an overall commitment in terms of key principles for managing health, safety and the environment. The Policy sets the overall HSE intentions of the organisation and contains a commitment to continuous improvement. The Policy is the starting point for setting VOGA's HSE objectives and targets. A copy of VOGA's HSE Policy is provided in Appendix A.

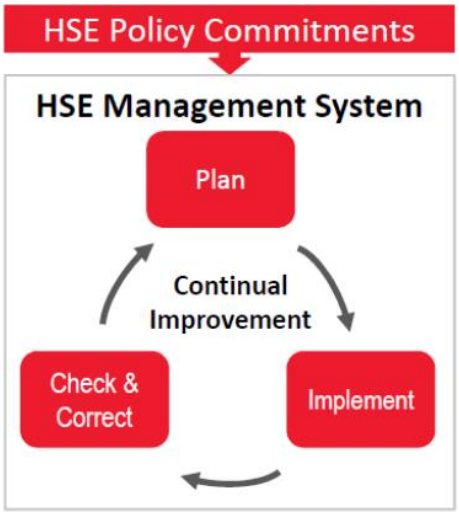
8.2.4 Contents

VOGA has developed an HSE MS that consists of three phases as follows:

- Phase 1: Plan
- Phase 2: Implement
- Phase 3: Check and Correct.

As outlined in Figure 8-2, the three-phase structure provides a continual improvement feedback cycle consistent with management system concepts that underlie the various standards. Each phase has one or more component element, and each element has multiple expectations.

Figure 8-2: Outline of HSE MS process – Plan-Implement-Check and Correct



The HSE MS is structured into 12 elements as outlined in Table 8-1; each element has been developed within the overall three-phase HSE MS process (Plan-Implement-Check and Correct). As such, each element connects to one or more of the other elements within the overall continual improvement cycle.

Table 8-1: Elements of HSE MS and objectives

Phase	HSE MS Elements	Objectives
Plan	Element 1: Management, Leadership and Policy	Management provides vision, resources and the environment for HSE MS success. All employees understand and are held accountable for the success of HSE MS. Performance excellence in HSE is recognised as a priority and prerequisite to successful business results.

Phase	HSE MS Elements	Objectives
	Element 2: Corporate and Social Responsibility and Communication with Stakeholders	VOGA is committed to protecting health, safety and the environment, and reducing and managing the HSE risks associated with its operations. In doing so, it is important that VOGA commit to an open dialogue with employees, the communities in which they operate, and other relevant stakeholders with respect to HSE issues associated with VOGA operations.
	Element 3: Risk Management	VOGA will ensure that risks are identified and managed to minimise the potential for incidents and liabilities.
	Element 4: MoC	Risks associated with change to personnel, organisations, procedures, practices, designs, facilities and regulatory requirements are identified, evaluated and managed.
Implement	Element 5: Training and Competency	Personnel are required to have the necessary skills and competencies to carry out their responsibilities in a safe and effective manner. Managers will ensure all employees have the appropriate skills and knowledge and will provide training where necessary.
	Element 6: Operations and Maintenance	HSE practices and procedures are necessary for the construction and operation of each asset. Practices and procedures are prescriptive “how to’s” of job tasks. The purpose of this element is to identify the requirements for practices and procedures necessary for each business/facility to ensure employees, contractors, the general public and the environment are protected from accidents/incidents.
	Element 7: Contractor Management and Procurement	It is important that controls are in place to ensure that activities undertaken by contractors, vendors and service providers are carried out in an efficient, safe and environmentally responsible manner.
	Element 8: Emergency Preparedness Management and Response	All operating areas have the necessary ERPs, skills and equipment to respond quickly to any emergency associated with our operations.
	Element 9: Incident Management	Reporting, investigating, analysing, follow-up and sharing information from incidents (and near misses) are used to minimise future occurrences.
	Element 10: Security Management	VOGA protects its people and assets from security risks and threats.
	Element 11: Documentation and Records	Operating regions ensure relevant documentation and records required to meet regulatory and VOGA business entity internal performance requirements, are maintained, organised and accessible.
Check and Correct	Element 12: Performance Assessment	Continual improvement is assured through regular assessments, audits and reports to management.

8.2.5 Review of the HSE MS

To ensure ongoing effectiveness and continual improvement of the HSE MS, VOGA and Vermilion Energy Inc. periodically review the elements of the HSE MS, including Element 12. This review process is intended to provide a mechanism for making changes to the HSE MS as necessary to achieve the organisational goals and meet the expectations of stakeholders. VOGA and Vermilion Energy Inc. Senior Management review VOGA HSE MS performance in order to achieve the following:

- Determine its continuing suitability, adequacy and effectiveness
- Address possible needs for changes to the HSE Policy, procedures, objectives, targets and other elements of the management system
- Identify opportunities for continual improvement.

VOGA and Vermilion Energy Inc. Senior Management review the effectiveness of the VOGA management system and provide formal feedback to assure continual improvement through:

- An annual review of VOGA HSE MS performance
- Monthly review of HSE Key Performance Indicators (KPIs)
- Incident reports (as required)
- Audit reports (as required).

Checklists detailing content, inputs and outputs of the annual review and monthly review of HSE KPIs are provided in Performance Assessment Manual: Performance Assurance [VOG-1100-YG-1201.02].

8.3 Implementation of Controls

8.3.1 Well Construction Management System

All activities carried out during the planning and execution of well campaigns are carried out in accordance with VOGA's HSE MS. However, the HSE MS is focused on the design, operation and maintenance of production operation systems. As such it does not provide the appropriate focus for management of well operations. The Well Construction Management System (WCMS) was created to provide a structure that is consistent with the HSE MS but focused on guiding the safe and efficient management and execution of well construction and exploration drilling activities. The WCMS is directly aligned to the HSE MS. It is headed by the VOGA HSE Policy and meets the objectives of each HSE MS Element. The objectives attached to each element of the HSE MS are detailed in Table 8-2 along with a description of how the WCMS meets these objectives.

In addition to execution of activities in accordance with VOGA's WCMS, well operations must also be carried out in accordance with the MODU Contractor's management systems. To ensure compliance with both management systems, they are aligned through the facility Safety Case Revisions.

Table 8-2: EP key roles and responsibilities

HSE MS/WCMS elements	HSE MS/WCMS objectives	Exploration drilling expectations
Element 1: Management, Leadership and Policy	Management provides vision, resources and the environment for HSE MS success. All employees understand and are held accountable for the success of HSE MS. Performance excellence in HSE is recognised as a priority and prerequisite to successful business results.	The Well Construction Manager and Drilling Superintendent demonstrate visible leadership and proactive commitment to HSE performance through personal example. Management are expected to visit the MODU at least once a month during a campaign, to interact with the workforce and observe operational practices. Refer to Section 8.3.5.
Element 2: Corporate and Social Responsibility and Communication with Stakeholders	VOGA is committed to protecting health, safety and the environment, and reducing and managing the HSE risks associated with its operations. In doing so, it is important that VOGA commit to an open dialogue with employees, the communities in which they operate, and other relevant stakeholders with respect to HSE issues associated with VOGA operations.	Operations will only be carried out when residual risk associated with known hazards is reduced to ALARP to protect health safety and the environment. VOGA has a process for managing external communications with relevant persons during the drilling campaign process. There is also a process in place to respond to public concerns related to HSE issues (Sections 8.4 and 9).
Element 3: Risk Management	VOGA will ensure that risks are identified and managed to minimise the potential for incidents and liabilities.	Exploration drilling activities will be undertaken in accordance with VOGA Risk Management Manual [VOG-2000-MN-0001]. Separate HAZID and HAZOP assessments are held for all drilling campaign activities and a project specific Risk Register will be maintained. This is to ensure the environmental impacts and risk of the activity continues to be identified and reduced to ALARP. A project specific Commitments Register will also be developed for all well construction campaigns (Section 8.4.1).
Element 4: Management of Change (MoC)	Risks associated with change to personnel, organisations, procedures, practices, designs, facilities and regulatory	The well construction MoC process meets the expectations of the HSE MS by ensuring that any changes to drilling operations are managed to

HSE MS/WCMS elements	HSE MS/WCMS objectives	Exploration drilling expectations
	requirements are identified, evaluated and managed.	ensure that the HSE risks arising remain at an acceptable level. This process will be followed throughout the well construction campaign. Further details on the MoC process are provided in Section 8.5.
Element 5: Training and Competency	Personnel are required to have the necessary skills and competencies to carry out their responsibilities in a safe and effective manner. Managers will ensure all employees have the appropriate skills and knowledge and will provide training where necessary.	The Well Construction Manager has responsibility for ensuring the competency of personnel for each position in the VOGA well construction team and for providing required training to close any identified competency gaps within the team. Further details on training and competency are provided in Section 8.3.6.
Element 6: Operation and Maintenance	HSE practices and procedures are in place for each business/facility to ensure employees, contractors, the general public and the environment are protected from accidents/incidents.	All drilling campaigns are planned and executed in accordance with the Well Construction Process Manual [VOG-5000-MN-0002]. Wells are designed and constructed in accordance with the Well Construction Standards Manual [VOG-5000-MN-003] (Section 8.3.2).
Element 7: Contractor Management and Procurement	Controls are in place to ensure that activities undertaken by contractors, vendors and service providers are carried out in an efficient, safe and environmentally responsible manner.	Contractors and vendors will be selected in accordance with the VOGA Contractor/Vendor Selection and Management Manual [VOG-1000-MN-0001]. Each high-risk contractor is assessed to ensure they meet a minimum level of service capability inclusive of management systems to ensure acceptable QHSE performance and personnel competency. Further detail is provided in Section 8.3.4.
Element 8: Emergency Preparedness and Response	All operating areas have the necessary emergency response plans, skills and equipment to respond quickly to any emergency associated with our operations.	The following emergency response documents are revised during the Detailed Design Planning Phase of a drilling campaign:

HSE MS/WCMS elements	HSE MS/WCMS objectives	Exploration drilling expectations
		• Wandoo Emergency Response Plan [VOG-2000-RD-0017] • Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] • Wandoo Field Source Control Emergency Response Plan (SCERP). These documents include plans for managing credible unplanned incidents, emergency response and recovery. Further details are provided in Section 8.7.
Element 9: Incident Management	Reporting, investigating, analysing, follow-up and sharing information from incidents (and near misses) are used to minimise future occurrences.	All incidents and near misses are systematically reported, investigated and corrective and preventative actions undertaken in accordance with the VOGA Event Management Manual [VOG-2000-MN-0003].
Element 10: Security Management	VOGA protects its people and assets from security risks and threats.	On VOGA contracted rigs, all incidents and accidents are investigated in accordance with the Drilling Contractor Safety Management System which has been reviewed for alignment with VOGA expectations.
Element 11: Information Management	Operating regions ensure relevant documentation and records required to meet regulatory and VOGA business entity internal performance requirements are maintained, organised and accessible.	Potential risks to security during the drilling campaigns and any prevention or mitigation strategies are reviewed as part of the development of the project-specific Risk Registers.
Element 12: Performance Assessment	Continual improvement is assured through regular assessments, audits and reports to management.	Critical documents will be issued and maintained under the VOGA Document Management System.

8.3.2 Well Control

VOGA designs its wells and plans and executes its exploration drilling operations in a manner that complies with its WCMS.

One of the major environmental hazards associated with drilling activities is the potential for loss of well control. The WCMS specifies engineering standards and well design and operational

practices to be implemented during the planning, design and execution phases of a drilling campaign to mitigate the risks associated with the activities are reduced to ALARP for the life of a well.

Key elements are:

- *Well integrity critical equipment (e.g. casing, tubing, Xmas Tree, safety valve, etc.) selection*: The equipment specification and operational processes ensure that the well integrity critical equipment installed in a well or used during the drilling process provides a suitable pressure envelope for well integrity purposes.
- *Well cementing design*: The well design and operational processes ensure that casing strings are adequately cemented into the well to provide a suitable annular pressure envelope for well integrity purposes.
- *Drilling fluids*: The well design and operational processes ensures that fluids are specified and maintained such that primary well control is maintained at all times during drilling activities.

VOGA's WCMS provides a structured approach to the engineering, design, planning and preparation for drilling and intervention operations. This process enables the activities to be carried out in a manner that provides a safe working environment for its employees and contractors and ensures that potential environmental impacts are reduced.

A critical component of the well design, operational planning and execution processes is to ensure that the risks that could have a material impact on project success, health, safety and/or the environment are identified.

Risks are captured in the Project Risk Register, which is maintained as a living document throughout the planning process (Risk Management Process). Risk review and HAZID workshops, involving both VOGA and contractor personnel, are used throughout the planning process to assess the risks and controls associated with specific activities. This allows appropriate risk mitigation strategies to be put in place, where relevant, as the operations programs are prepared, thus ensuring that residual risk associated with the planned activities are reduced to ALARP.

The Well Construction Standards Manual (WCSM) [VOG-5000-MN-003], a key reference document within the VOGA WCMS, specifies the required barrier standards to be applied during the well design and operational planning and execution processes.

Peer review and Drill Well on Paper workshops are held with both internal and external peers to review well designs and operations plans and risks (and to identify potential improvements prior to operations).

Performance monitoring is used throughout the planning and execution phases to provide assurance that the required controls are established:

- Critical controls are subject to performance verification and monitoring and deviation management processes to ensure continual management of risk to ALARP.
- The campaign-specific Commitments Register identifies commitments made under the WCMS, campaign-specific Safety Case Revisions, EPs and other relevant campaign

documents. Ongoing update and review of the Commitments Register provides VOGA management with assurance that campaign commitments are being met.

- MODU equipment and MODU Contractor management systems are assessed during pre-hire inspections and management system audits.
- Pre-start MODU inspection and audit processes ensure that well and pressure control and monitoring equipment is present on the rig and is maintained and functioning. VOGA audits contractors to ensure fit-for-purpose well and pressure control equipment is provided, and that the contractors' PMS includes their well and pressure control equipment.
- Well and pressure control equipment testing requirements have been met and the relevant testing has been verified by a senior member of the MODU Contractor and VOGA offshore supervisory teams.

In addition, VOGA conducts internal reviews to demonstrate compliance with its WCMS.

Application of the well design and operational planning and execution processes ensure that project risks are identified and appropriately managed, reducing the residual risk associated with the planned activities to ALARP.

8.3.3 Operational Controls and Recovery Mechanisms

VOGA's WCMS provides a structured approach to the management of operations, ensuring that:

- Operations are carried out while ensuring that commitments made under the VOGA management system, the Facility Safety Cases and the Project Simultaneous Operations (SIMOPS) Plan are met
- Change is managed in accordance with the MoC Process.

Operating in accordance with the MODU's Safety Case and VOGA's operating standards ensures:

- The various controls associated with maintaining well integrity are in place. This includes ensuring that well control equipment and well barriers are tested and verified, and well control drills are regularly carried out to ensure personnel react instinctively at critical times.
- VOGA's barrier verification process is applied, which provides assurance to all stakeholders that well integrity is being managed in accordance with the WCSM [VOG-5000-MN-003]. This confirms that a minimum of two independent and verified barriers are in place at all times in order to prevent the uncontrolled release of well fluids to the environment.
- MoC procedures are applied to ensure that a rigorous process is followed to assess and manage any risk associated with changes to designs or plans and their potential impact on related critical control measures.

8.3.4 Contractor Management and Procurement

8.3.4.1 Contractor Selection

The manner in which VOGA executes its drilling activities means that many risks are embedded in activities and processes that are controlled and progressed by service or contractor organisations and contractor personnel. VOGA selects drilling contractors and service providers

in accordance with the VOGA Contractor/Vendor Selection and Management Manual [VOG-1000-MN-0001]. Each high-risk contractor is assessed to ensure they meet a minimum level of service capability, inclusive of management systems to ensure acceptable QHSE performance and personnel competency. If shortcomings are identified during the assessment process, they are reviewed with the contractor in question and, where necessary, management processes are applied to address critical areas of concern.

When carrying out activities on a VOGA-contracted MODU, all contractors are required to work in accordance with the MODU Safety Case for which compliance with the HSE MS and this EP are fundamental requirements.

VOGA requires that:

- The specifications of equipment or materials that have potential QHSE impacts are reviewed to verify suitability for the intended use and to mitigate against the introduction of additional risks.
- All requisitions for materials and equipment specify, where relevant, appropriate certification and inspection requirements.
- Induction programs are in place to ensure that personnel are aware of the management systems in use during the operations and to communicate any major HSE risks and their management strategies.

VOGA commissions pre-mobilisation inspections of the MODU and vessels to ensure their compliance with applicable standards and contractor management systems and to confirm that they can operate in a safe and environmentally responsible manner. Further detail on inspections and audits undertaken is provided in Section 8.9.

8.3.4.2 Procurement

The WCSM [VOG-5000-MN-0003] stipulates the technical standards to be applied for the design, manufacture and testing of equipment used during drilling operations. All Purchase Orders specify the technical standards to be applied during the design, manufacture and testing process.

VOGA's wells are designed from a life-of-field perspective in accordance with sound engineering principles and to comply with relevant legislative requirements. VOGA utilises existing API or ISO standards as a basis for equipment and material specification rather than developing VOGA specific standards.

For well integrity critical equipment, VOGA only procure or rent equipment that meets relevant API or ISO standards. The relevant standards for the various equipment types used during VOGA's drilling and intervention activities are specified in the WCSM.

Independent third-party validation of the application of a manufacturer's quality assurance system is carried throughout the manufacturing process for any critical equipment purchased by VOGA for installation during a drilling operation.

VOGA uses internal resources, or contracts third party QA/QC specialists, to supervise the inspection and testing of well integrity critical equipment during its manufacture, or during its

preparation for operations. This process provides assurance that the well integrity critical equipment used in VOGA's drilling process conforms to VOGA's specified standards. As such, the process ensures that the residual risk associated with the failure of well integrity critical equipment has been reduced to ALARP.

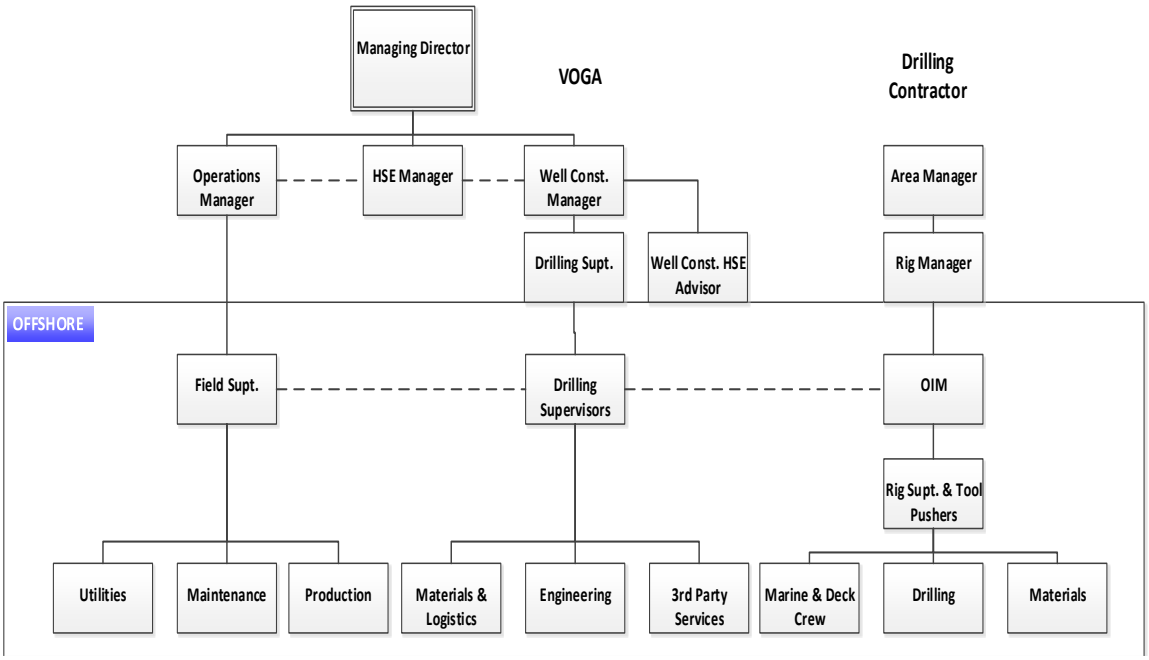
VOGA requires all new or refurbished critical equipment to be supplied with manufacturer/ supplier's Certificate of Conformance to demonstrate compliance with design, manufacturing and testing specifications.

8.3.5 Key Roles and Responsibilities

Key roles and responsibilities for VOGA and its contractors have been identified for future drilling activities to ensure all elements of the EP Implementation Strategy are effectively applied.

The organisational chart (Figure 8-3) indicates the relevant key personnel for a exploration drilling project.

Figure 8-3: Combined organisation chart – VOGA and MODU personnel



A description of the roles and responsibilities of the key positions within the organisational chart are outlined in Table 8-3.

Table 8-3: EP key roles and responsibilities

Role	Responsibility
VOGA Managing Director	• Review and approve EP and OPEP. • Ensures that appropriate resource and competence levels are available to deliver safe, efficient and effective operations within VOGA's organisation.

Role	Responsibility
	• Ensures overall compliance with the VOGA HSE MS. • Ensures overall compliance with the EP and OPEP with advice from the HSES Advisor. • Responsible for facilitating an emergency response strategy in the event of an incident.
VOGA Well Construction Manager	• Ensures that VOGA's WCMS is applied and maintained. • Ensures EP has been accepted by NOPSEMA before activity commences. • Ensures compliance with EP. • Reviews EP prior to each campaign and confirms that appropriate performance outcomes, standards and measurement criteria are in place for all identified environmental risks. • Ensures that all well construction/drilling personnel (including contractors) are aware of their responsibilities in regard to ensuring compliance with the Commitments Register and that processes are in place to meet them. • Oversees all aspects of contracting, procurement, logistics, QHSE, planning, design, execution and review for drilling activities. • Ensures appropriate resources and competence levels are available to deliver safe, efficient and effective drilling activities. • Ensures that effective emergency response systems are in place for drilling operations. • Ensures that VOGA's stated obligations are met during all drilling activities. • Ensures that the policies and procedures of the various drilling contractor companies are consistent with the VOGA Management Systems. • Ensures that project objectives are clearly communicated to all drilling personnel including contractors. • Ensures activities specified in the campaign specific Commitments Register are appropriately closed out. • Ensures that all significant changes that may increase risk to environment are managed via the MoC Process. • Ensures NOPSEMA notified at least 10 days prior to the commencement and within 10 days after the completion of drilling activities.
VOGA Well Construction QHSE Advisor	• Coordinates the QHSE process associated with the planning, design, execution and review for drilling activities. • Assists in the development and ongoing maintenance of VOGA's WCMS components. • Assists with the development of this EP. • Ensures risk management and change control is implemented in the planning and execution of drilling activities. • Ensures monitoring is undertaken as outlined in the EP. • Prepares and ensures delivery of environmental content at inductions. • Prepares monthly report to NOPSEMA outlining non-conformances with performance standards for submission by the VOGA HSES Advisor. • Leads/participates in incident investigations and analyses. • Retains specialist services to assist in the audit and inspection process.

Role	Responsibility
	• Tracks close-out of action items resulting from investigation, audit and review processes. • Liaises with the VOGA HSES Advisor for interfaces between the drilling and VOGA management system requirements. • Coordinates collation of monthly QHSE statistics and reporting during drilling campaigns. • Ensures EP compliance report is prepared and submitted to NOPSEMA. • Ensures that any non-conformances are reviewed, and the implementation strategy of the EP revised as a result. • Participates in review of EP for applicability prior to campaigns. • Conducts HSE inductions. • Acts as the HSE support in drilling related emergency response events. • Participates in emergency response drills. • Facilitates QHSE interface with contractors and MODU sharing partners. • Maintains the campaign specific Commitments Register. • Approval of chemicals proposed for use at the start of each drilling campaign.
VOGA Drilling Superintendent	• Ensures appropriate resources are available on the MODU to deliver safe, efficient and effective drilling activities. • Ensures that contractors have appropriate arrangements necessary for compliance against this EP. • Ensures compliance with the provisions of this EP and OPEP by both VOGA and contractor personnel. • Reviews the EP to assure all EP related risks are stated and communicated. • Ensures that all personnel are inducted to the requirements of this EP. • Ensures all audits, reviews, monitoring records identified in this plan are progressed and appropriately reported. • Ensures that all environment-related incidents are reported to the Well Construction Manager and the Wandoo Field Superintendent. • Assists with ensuring that all environment-related incidents are reported and appropriately analysed for causes. Ensures that all significant changes that may increase risk to environment are managed via the MoC Process.
Logistics Coordinator	• Ensures all VOGA purchased/supplied materials and equipment for use in drilling operations meet the standards laid out in the WCMS prior to acceptance and dispatch. • Maintains records of independent review and inspection activities associated with the purchase/supply of materials and equipment. • Ensures appropriate logistical resources are available in the field and in the supply base to deliver safe, efficient and effective drilling activities. • Coordinates the efficient unloading of materials and unloading of waste in accordance with procedures outlined in the EP.
Wandoo Field Superintendent	• Ensures compliance with VOGA HSE MS, EP and OPEP. • Leads/participates in audits and inspections.

Role	Responsibility
	• Ensures that environmental incidents are reported to statutory authorities and internal reporting and investigation requirements conducted and corrective actions are completed. • Ensures drills and exercises for emergency response are completed. • Ensures corrective actions arising from audits and emergency response drills are complete. • Manages coordinating and controlling of all field operational activities (production, maintenance, procurement and logistics). • Acts as Permit to Work custodian, in accordance with the project-specific SIMOPS Plan, for drilling activities and ensures that the potential impact of a SIMOPS environment is considered during the preparations for all activities. • Provides leadership and stewardship for environment protection. • Meets all operational and HSE Key Performance Indicators (KPIs) as set by VOGA. • Executes duties as the emergency commander during emergency response.
VOGA Drilling Supervisor	• Supports the induction of the offshore supervisory team. • Implements the MODU-based elements of the campaign audit plan and environment commitment schedule. • Provides primary liaison and interface management between the MODU Offshore Installation Manager and the Wandoo Field Superintendent for implementing the campaign-specific SIMOPS Plan. • Manages the offshore aspects of drilling operations to meet QHSE and project objectives. • Ensures that the VOGA WCMS is actively implemented during operations. • Ensures that all HSE and operational commitments are met, and standards are adhered to. • Ensures that the deviations to well programs are managed in accordance with the drilling MoC process. • Works with the AHTS vessel masters to ensure a very high focus is placed on HSE for all vessel activities while they are operating for VOGA. • Monitors relevant critical risk controls and ensuring that these are in place and effective prior to the commencement of activities. This includes ensuring that the commitments made in the VOGA management systems, the Wandoo Field Safety Case update, the MODU Safety Case Revision and the campaign-specific SIMOPS Plan are honoured and that MODU-related actions in the Commitments Register are closed out as required. • Provides technical and logistical support to the Offshore Installation Manager during emergency response or incident management. • Leads the MODU-based QHSE audit and review activities and ensuring close-out of action items resulting from investigations, audits and review processes.
MODU (Rig) Offshore Installation Manager	• Ensures all operations carried out on-board the MODU are consistent with environmental legislative requirements and ensures compliance with the requirements laid out in this EP.

Role	Responsibility
	• Notifies the VOGA Drilling Supervisor of any deviations from VOGA EP performance standards for MODU-based risk controls measures. • Ensures monitoring is undertaken in accordance with EP requirements. • Ensures that personnel appointed to positions with responsibility for emergency response (including well control) are trained and competent to fulfil those responsibilities and are familiar with the MODU's emergency response equipment (including that associated with well control). • Ensures corrective actions identified during environmental audits are implemented. • Implements the MODU's Well Control Plan as defined in the company's Well Control Procedures and the company emergency response plans. • Ensures that the MODU Contractor's HSE MS are implemented and effective. • Provides input to EP and OPEP if required. • Reports all incidents to the Wandoo Field Superintendent and the VOGA Drilling Supervisor.
MODU (Rig) Manager	• Ensures that the MODU Contractor's HSE MS is implemented and effective on the MODU. • Ensures that the MODU Contractor's HSE MS will meet the requirements of this EP. • Ensures that the environmental performance data is collected and reported in accordance with this EP. • Conducts audits and reviews in accordance with the MODU Contractor's HSE MS. • Provides leadership and stewardship with respect to performance against this EP. • Provides input to EP and OPEP as required.
Vessel Master	• Ensures that all operations on board the vessel are carried out in accordance with environmental legislative requirements, commitments, conditions and procedures as provided in this EP. • Ensures monitoring is undertaken in accordance with EP requirements. • Report all incidents to the VOGA Drilling Supervisor. • Provides input to EP and OPEP as required.

8.3.6 Training and Competency

8.3.6.1 Overview

The Well Construction Manager has responsibility for ensuring the competency of personnel and for providing required training to close any identified competency gaps within the well construction/drilling team. The Well Construction Manager ensures that HSE awareness and commitment are an integral part of team selection and subsequent training, and that a process is in place to ensure employees, contractors and visitors are aware of relevant hazards, risks and controls.

The Well Construction Process Manual [VOG-5000-MN-0002] describes a process for selecting a competent and fully trained well construction/drilling team for each campaign. Responsibilities are assigned in the Well Construction Process Manual [VOG-5000-MN-0002] to ensure that single-point accountabilities exist for the execution of essential activities, thereby ensuring that vital work necessary for the maintenance of controls is not overlooked.

Expectations are that:

- HSE critical positions are identified
- Job descriptions, which clearly describe individual responsibility towards HSE, are agreed with key department personnel
- Personnel are competent in their assigned roles or tasks
- All personnel hold relevant qualifications, certification and experience for their job
- Induction programs are in place to ensure all personnel are aware of any major HSE hazards and the management systems in operation at their site
- VOGA staff are appraised for their performance, including HSE performance.

8.3.6.2 Inductions

All personnel working on activities under this EP will receive an induction that includes the following information:

- An overview of the VOGA HSE MS, WCMS and EP with particular emphasis on performance outcomes, standards and measures
- Major project risks and their associated mitigation strategies
- Emergency response roles and responsibilities
- Regulatory and procedural requirements.

Inductions will be conducted at the following locations:

- VOGA Perth Office – to communicate and assign responsibility for office-based EP performance standards.
- MODU – to communicate expectations to personnel and crews, and ensure personnel are aware of relevant EP performance standards and emergency response roles and responsibilities.
- AHTS vessels – to communicate expectations to crews and are aware of relevant EP performance standards. Including, but not limited to, Part 8 of the EPBC Regulations.
- Ongoing awareness – will be maintained through discussion at Pre-Tour Meetings, daily SIMOPS Coordination Meetings, weekly HSE meetings and weekly contractor communication meetings.

8.3.6.3 Competence of Personnel

VOGA assures the competence of personnel working on its operations through a combination of the verification of personal knowledge, qualifications and training, and through the provision of additional project specific training.

VOGA requires that their contractors demonstrate that they operate under a competency management system that ensures their personnel are competent for their assigned positions. More specifically, the Drilling Contractor's personnel must be compliant with the competency matrix defined within the MODU Safety Case.

VOGA's senior well construction/drilling personnel and the MODU Contractor's MODU-based senior drilling personnel must maintain current well control certification from the International Well Control Forum (IWCF) or International Association of Drilling Contractors (IADC) accreditation organisations, providing an internationally recognised level of well control competence assurance.

VOGA and the Drilling Contractor conduct inductions for personnel coming onto the MODU to communicate the project objectives along with risks and specific controls to ensure that the activities described in the drilling campaign are achieved safely.

During operations, drills are conducted in accordance with the MODU Safety Case to ensure that personnel react promptly to changes in well parameters, suspend operations and, if necessary, shut-in the well without deferring to a higher authority.

The combination of competence assurance, induction and drills demonstrate that personnel working on VOGA's drilling operations are competent, providing a key element towards ensuring that safety, environmental and well integrity related risks are managed to ALARP.

8.3.7 Chemical Assessment Process

VOGA has a chemical assessment and selection process to manage the risks and impacts associated with discharge of chemicals to the marine environment to ALARP during drilling activities.

VOGA uses the chemical ranking scheme developed through the Oslo and Paris Conventions (OSPAR) Commission decision 2000/2 and the OSPAR list of substances considered to Pose Little or No Risk to the Environment (PLONOR) to the environment to determine the risk of discharge of chemicals to the environment in order to select the lowest toxicity chemicals practicable.

Under the OSPAR list, chemicals are ranked using the Chemical Hazard and Risk Management (CHARM) model. The CHARM model calculates the ratio of Predicted Effect Concentration against Predicted No Effect Concentration (PEC:PNEC). This is expressed as a Hazard Quotient (HQ), which is then used to rank the product. HQ is converted to a colour banding to denote its environmental hazard (Table 8-4) which is then published on the Definitive Ranked Lists of Approved Products by the OCNS.

Products not applicable to the CHARM model (i.e. inorganic substances, hydraulic fluids or chemicals used only in pipelines) are assigned an OCNS grouping, A-E. Group A includes products considered to have the greatest potential environmental hazard and Group E the least.

Any chemical that will be discharged to the marine environment during drilling activities shall meet at least one of the following criteria:

- The chemical is listed on the OSPAR List of Substances Used and Discharged Offshore which are considered to PLONOR
- The chemical has a HQ banding of Gold or Silver or an OCNS grouping of E or D in accordance with the OCNS Definitive Ranked List of Registered Substances.

If the chemical is not OCNS listed, the ecotoxicity data will be assessed in accordance with the OCNS system. The OCNS system requires bioaccumulation, biodegradation and aquatic toxicity data from relevant species such as algae, crustacea or fish to be assessed. Once appropriate ecotoxicity values are obtained, they will be evaluated against the OCNS grouping data.

An ALARP justification is required for any chemicals not OCNS listed, if listed with a substitution warning, if there is no available ecotoxicity data, or if ecotoxicity is available but:

- LC50 <10 mg/L or EC50 <10 mg/L
- The bioaccumulation octanol-water partition coefficient (log Pow)>3, or
- The percentage biodegradation within 28 days is <20%.

The ALARP justification assesses the chemical requiring approval and available alternative options in accordance with the following factors (in order of priority):

- Health and safety criteria (Dangerous Goods Class and Safe Work Australia risk phases)
- Ecotoxicity criteria (aquatic toxicity, bioaccumulation and biodegradation data for relevant species)
- Cost.

The change of chemical will be risk assessed and documented in a MoC in accordance with the process outlined in Section 8.5.

Table 8-4: OCNS HQ and colour bands

Minimum HQ value	Maximum HQ value	Colour banding	
>0	<1	Gold	Lowest hazard
≥1	<30	Silver	
≥30	<100	White	
≥100	<300	Blue	
≥300	<1,000	Orange	
≥1,000	-	Purple	Highest hazard

8.3.8 Biofouling Risk Assessment Process

The biofouling risk assessment process is undertaken as part of the process for engaging a new Contractor for activities involving vessel and/or immersible equipment, or for the mobilisation of a previously contracted vessel known to have an increased risk profile since last use (e.g. extended period in Port).

The process excludes ballast water management. Ballast water risk is managed under the *Biosecurity Act 2015*, Australian Ballast Water Management Requirements (DAWE, 2020), consistent with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Management Convention) (IMO, 2004).

The following steps outline the VOGA Biofouling Risk Assessment Process:

Step 1: Conduct Review of Relevant Contractor Procedures and Documentation:

- Biofouling Management Plan consistent with IMO guidelines
- Biofouling Record Book
- Antifouling Coating Certificate
- Immersible equipment management procedures.

Step 2: Conduct Biosecurity Risk Assessment (vessel and/or immersible equipment):

- Gather relevant information (where available)
- Recent inspection(s) – date/location and any corrective actions taken
- Dry dock/cleaning information – date/location
- Operational history (e.g. operating out of areas with known IMS)
- Anti-fouling Coatings (AFC) – valid, age, coverage, appropriate for vessel activity profile
- maintenance and inspection records and biocide dosing information for Marine Growth Prevention Systems (MGPS)
- Vessel operating profile – including any details of vessel operating outside normal profile, extended inactive periods
- Vessel previously located in high-risk area (vessel sharing with other high or uncertain risk conveyance/platform, ports with established IMS)
- Immersible equipment activity profile and history
- Immersible equipment cleaning, drying, maintenance and storage practices
- Planned activity profile for vessel immersible equipment – proximity to Wandoo infrastructure
- The WA Department of Agriculture, Fisheries and Forestry (DAFF) biosecurity reporting may be used to validate the low-risk status of commercial vessels frequenting WA waters
- Assess risk using the VOGA Risk Management Manual [VOG-2000-MN-0001] based on biofouling risk indicators from WA DAFF. Risk indicators will include the following:
  - history of the vessel/facility, including time spent in ports of call since last dry dock, cleaning regime or marine pest inspection results
  - time between a biofouling inspection and mobilisation to an offshore activity to inform exposure risk following the last inspection and justify the relevance of biofouling inspection findings

- presence of an appropriate biofouling management plan and effective implementation of the plan
- level of existing biofouling and the presence of species of concern (in particular, the presence of marine pests) within biofouling communities on the vessel/infrastructure associated with the activity (informed by biofouling record books, maintenance records, cleaning results or inspection programs)
- operational profile relevant to biosecurity risk such as operating speed, time alongside a facility and the need for ballast exchanges while engaged in an offshore activity.

Step 3: Further Risk Mitigation Actions:

If a low risk is not identified, an IMS expert will be engaged to review risk assessment and recommend mitigation measures to implement for the vessel risk to be acceptable. Further information must be obtained, and action undertaken to reduce risks to an acceptable level (i.e. low risk or further risk mitigation actions implemented) prior to proceeding with engagement of vessel or equipment. Mitigation measures include:

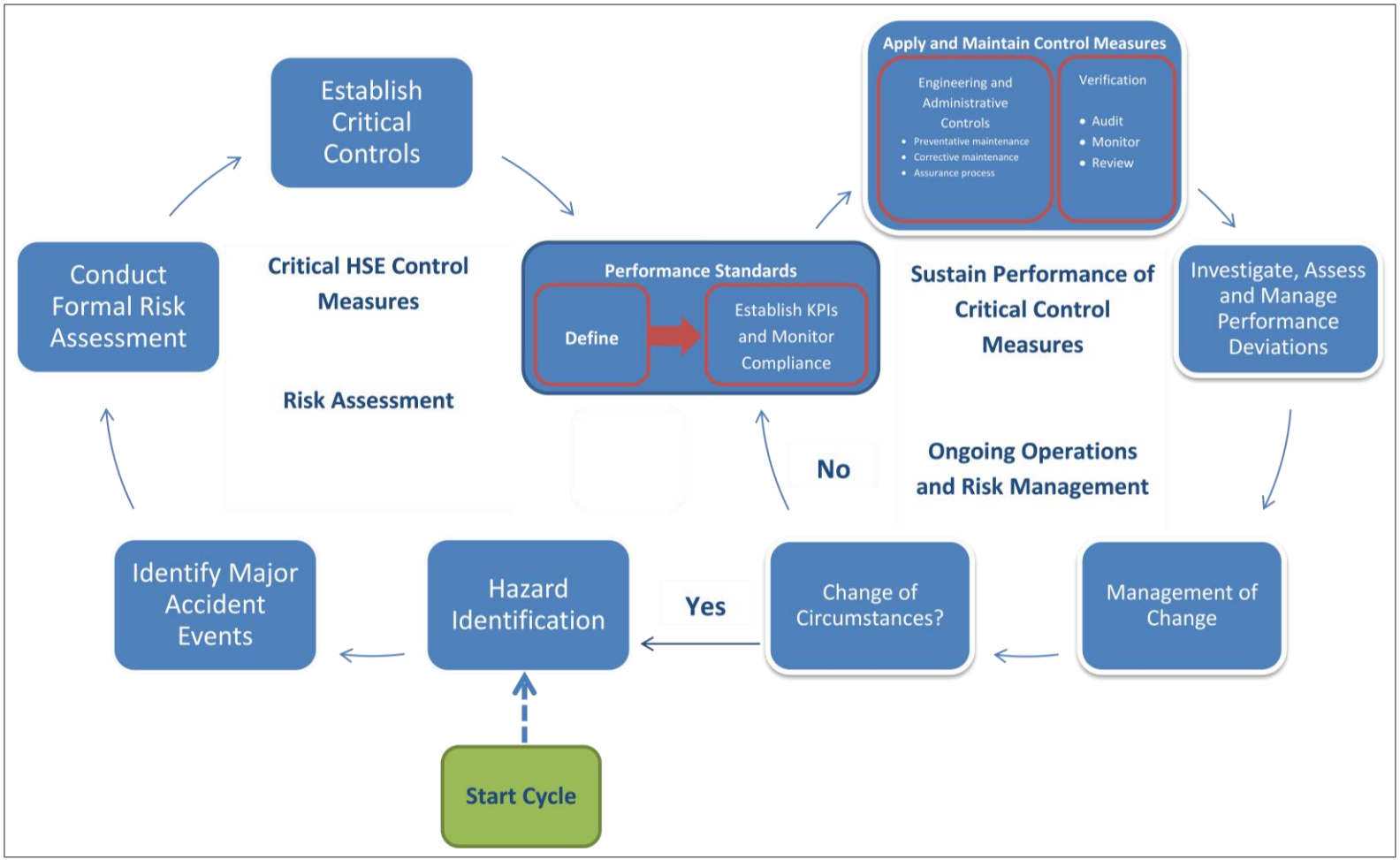
- Engage independent IMS expert to conduct visual inspection
- Cleaning of biofouling on submerged surfaces to reduce the risk of marine pest transfer
- Additional marine growth prevention measures (e.g. dosing of internal seawater system with biocides, application or re-application of AFC)
- Using alternative vessels or other mobile components or equipment that have a demonstrated low biosecurity risk profile.

8.3.9 Managing Critical Controls

The process of defining and determining VOGA's performance outcomes, standards and measurement criteria are defined in Section 4. The implementation framework is based on the right-hand side loop of the Performance Standards cycle in Figure 8-4, as part of the Ongoing Operations and Risk Management component of the performance improvement process (Figure 8-4). The framework includes four key areas:

- Apply and maintain control measures: Addressed through the implementation of VOGA's HSE MS and operations and maintenance routines.
- Verify and monitor compliance: Conducted using the Commitments Register discussed in Section 8.4.1.
- Investigate, assess and manage performance deviations: When a control fails to meet its defined performance standard the well construction/drilling team utilises the MoC process to assess the change in risk and identify appropriate risk management strategies.
- MoC: Changes to the facility for operational purposed, changes due to investigation into a performance deviation and changes to performance standards themselves are all assessed through VOGA's MoC process which addresses the potential impact of the change to the environment. This is discussed in Section 8.5.

Figure 8-4: Performance Standards and Continuous Improvement (adapted from NOPSEMA's Control Measures and Performance Standards' Guidance Notes, 2011)



8.3.10 Ongoing Hazard Identification and Evaluation

Project risks, including environmental risks, are managed during the drilling process in accordance with the principles of AS/NZS ISO31000:2009, the requirements of the OPGGS(E)R and the VOGA Risk Management Manual [VOG-2000-MN-0001] and is in line with the requirements of the OPGGS(E)R. The Risk Management Process is described in the Well Construction Process Manual [VOG-5000-MN-0002] and in Section 4 of this EP.

Activity-related risks are reviewed during all phases of the project. The WCMS identifies 11 points of planning reference for identification, review of and management of risks. The Risk Management Process runs in parallel with the drilling core processes and interfaces with them at various key stages.

8.3.10.1 Planning Phase

Separate HAZID and HAZOP assessments are held for all planned wells, sequences of similar wells, or well intervention activities to identify hazards and establish mitigation measures and contingency plan requirements that are specific to the project or well.

Environmental hazards and their respective controls have been documented in Section 5 of this EP along with the associated performance standards and measurement criteria. This forms the pre-operational risk assessment process.

8.3.10.2 Operational Phase

During drilling operations, risk management is achieved through routine and programmed activities and utilises the following tools to maintain environmental awareness for personnel:

- Daily pre-job meetings are held on the MODU prior to crews commencing work for the day. During this meeting operational and HSE issues and opportunities for improvement are discussed. Personnel are required to sign an attendance sheet.
- JSAs are carried out for new and critical activities to ensure personnel involved are aware of the planned activities, their roles and the associated operational and HSE risks and mitigation strategies.
- Toolbox meetings are held on a task based/as required basis to review a planned task and any controls required. This provides the crew members with clear directions and an opportunity to suggest improvements.
- A safety observation system will be in place on the MODU to identify report and manage exposures as well as to compliment positive behaviour. The process provides a feedback loop from the workforce which is reviewed by VOGA and MODU management on a daily basis.
- A lesson learned action tracking system is maintained during the project to provide input into after action reviews and assist in continuous improvement in VOGAs drilling operations.

During drilling operations, changes to planned operations may be required. VOGA applies a Well Construction MoC process to evaluate potential changes to an approved well program. The process assesses the impact of the change on:

- The operational and HSE risks profiles of the task and/or any dependent tasks
- Safety and well integrity critical controls
- Level of authorisation required for approval of the change
- To determine if the deviation should be progressed or declined.

8.3.10.3 Review phase

VOGA reviews operational and HSE performance at the conclusion of each campaign to ensure key learning points are captured for future projects and to ensure incidents have been adequately closed out and audit actions have been addressed. Environmental performance is reviewed and any identified opportunities for improvement are incorporated into subsequent drilling planning and revisions to this EP.

8.4 Monitoring and Review

VOGA recognises that an effective 'monitoring and review' process is an essential part of an overall risk management process. Monitoring and review is applied to achieve EPOs and commitments identified within the EP.

VOGA will monitor compliance with EP performance standards and commitments by applying a number of methods including:

- Management internal audits and inspections
- Third party audits and verification
- Daily operations meetings
- Performance review of construction activities.

The frequency of environmental monitoring is based on the risk level. VOGA personnel and management are responsible for ongoing monitoring of operational activities to ensure compliance with the EP.

8.4.1 Commitments Register

A Commitments Register will be developed to verify compliance with the campaign commitments, including this EP. The Commitments Register provides assurance that the standards and measurement criteria specified in this EP are being meet.

The Commitments Register also outlines the phase of the drilling campaign that the commitment applies to, and the personnel responsible for monitoring the compliance with each

commitment. A detailed description of the phases of the drilling campaign is provided in the Well Construction Process Manual [VOG-5000-MN-0002]. These phases include:

- Planning and design: This phase of the planning process occurs well in advance of execution, includes preliminary planning and detailed design
- Execution: Period when drilling operations are undertaken
- Campaign wrap up phase: Review of HSE performance including lessons learnt
- Emergency: During an emergency and its immediate aftermath.

The Well Construction Manager will ensure that all relevant well construction/drilling personnel (including contractors) are aware of their responsibilities with regard to ensuring compliance with this EP and ensuring that the processes are in place to meet them during drilling activities.

The VOGA QHSE Advisor is responsible for ensuring compliance with the Commitments Register.

Assurance of compliance with the Commitments Register will be undertaken by inspections and internal and external inspections and audits. Details of assurance inspections and audits are provided in Section 8.8.6.3.

8.4.2 Environmental Monitoring

The undertaking of the drilling activities and accidental events associated with the activities pose a range of different environmental risks. The risks have been comprehensively assessed in Section 5 of this EP and the incident reporting detailed in Sections 8.10.2 and 8.10.3.

8.4.3 Monitoring Impacts from Oil Pollution

The process and arrangements for monitoring the impacts from oil pollution are outlined in the Wandoo Field Operational and Scientific Monitoring Bridging Implementation Plan [VOG-1100-RG-0002] as appendices to the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].

Monitoring may include:

- Operational monitoring (Type I) which provides information of direct relevance to spill response operations, and/or
- Scientific monitoring (Type II) which relates to non-response objectives and includes short term environmental damage assessments, longer-term damage assessments (including remediation), purely scientific studies and all post-spill monitoring activities.

8.4.4 Review of the Environment Plan

A formal review and revision of the Wandoo Field Exploration Drilling EP will be undertaken every five years (as per Regulation 41 of the OPGGS(E)R). The five-year review will only be required if the drilling activities are not finished at that time, which is unlikely.

8.4.5 Annual Performance Review

VOGA undertakes an annual performance review in accordance with the Performance Assessment Manual – Performance Assurance [VOG-1100-YG-1201.02]. The scope includes the following:

- Compliance auditing results
- Operational results summary
- Reportable and recordable incidents to NOPSEMA
- Oil spill response assurance activities
- Relevant persons consultation activities
- EP and OPEP reviews undertaken.

8.5 Management of Change

8.5.1 Overview

The MoC, including deviations from critical controls, during drilling operations is managed through the MoC Process, which is consistent with the VOGA Risk Management Manual [VOG-2000-MN-0001]. The WCMS MoC process evaluates a proposed deviation from approved plans by:

- Outlining the deviation and the impact it may have on environmental risk levels
- Assessing whether any alternative/contingency controls should be implemented to manage risk to ALARP
- Assessing the residual risks and determining the conditions under which the activity can continue.

The risk assessment must be approved by the VOGA Well Construction Manager (or delegate).

VOGA manages temporary and permanent changes through an MoC process which utilises an approval form (MoC) and MoC Checklist. The MoC form provides a documented record of the change, including justification for the change, duration of change, engagement and communication, implementation, monitoring and review and authorisation and sign-off.

The MoC checklist is completed for every proposed change. The checklist includes high level screening of those changes which may impact on environmental aspects of regulatory compliance (Section 8.5.2).

Actions required to assess the impact of the change are identified through the MoC checklist and recorded on the MoC Form.

8.5.2 Regulatory Compliance

For those changes which have been assessed as having the potential for environmental regulatory compliance aspects the following questions are addressed:

- Could the change modify an existing EPOs or EPSs within the EP?

- Does the change propose significant modification, new stage of activity or are the activities to be carried out different from the activities contemplated in the accepted EP?
- Could the change result in a significant change in the overall level of risk and impacts identified in EP?
- Does the proposal change the HSE MS or an implementation plan within an accepted EP?

Consistent with Regulations 38 and 39 of the OPGGS(E)R, VOGA will revise the EP and submit for regulatory acceptance if there is a proposed change which will result in at least one of the following:

- A new activity
- A significant modification or new stage of the activity
- A new or increased environmental impact or risk, or
- A change of titleholder.

In accordance with the NOPSEMA Guideline – When to submit a proposed revision of an EP (N04750-GL1705) (NOPSEMA, 2024b), VOGA considers the following aspects when determining whether a modification, meaning how the activity is being managed and/or conducted, is significant:

- Continual reduction of the impacts and risks of the activity to ALARP
- The effect the change has on the ability to demonstrate EPOs and EPSs are being met
- The criticality of the aspect being changed (i.e. a management system change is likely more critical because of its coverage of all impacts and risks as opposed to an individual item of equipment)
- The degree of deviation from how the activity was described in the EP
- The effect the change has on meeting legislative obligations, such as the requirement to remove property and equipment from the title area.

A new stage of an activity is considered to be any change to the timing or spatial limits detailed in the accepted EP.

For individual changes, VOGA considers a change to be a “significant change to impact or risk” if:

- There is a resultant step change in overall risk level of an environmental hazard – whether by reassessment with updated information or an actual increase in impact or risk
- There is a change in environmental impact profile from emissions introduces new relevant persons or requires additional communication and agreements with existing relevant persons.

For the changes assessed as “significant”:

- If planned, the change will not be implemented without Regulatory acceptance, or
- If unplanned, e.g. initiated by incident, the change may be managed and implemented prior to resubmission. In this instance, a report and notification to the Regulator will be made in accordance with 8.10. Depending on the situation a resubmission of the EP to the Regulator

maybe required post the event. Cumulative impact of minor changes is reviewed as part of the annual reporting process. For these items, changes will have most likely been implemented prior to Regulatory submission.

8.6 Continuous Improvement

Continuous improvement is the process of enhancing the VOGA HSE MS to achieve improvements in overall environmental performance. The VOGA HSE Policy and the VOGA HSE MS provides criteria for ongoing assessment of environmental performance. This is achieved through the Performance Assessment Manual – Performance Assurance [VOG-1100-YG-1201.02], which outlines the monitoring and assessment tools and processes VOGA uses to monitor HSE performance and compliance.

Performance assurance is conducted to monitor effectiveness, provide assurance and identify improvement opportunities. Assessment of HSE performance generally encompasses:

- Monitoring, measurement, analysing and reporting HSE data
- Conducting HSE audits and inspections, according to performance standards, pre-established intervals and ad hoc safety critical situations
- Tracking and close-out of HSE actions
- Conducting management reviews.

Performance monitoring is primarily achieved by establishing and reporting on leading and lagging KPIs. Quarterly HSE performance reports are provided to the HSE Subcommittee of the Vermilion Energy Inc. Board in Canada.

HSE MS documents are updated as required to include changes of procedure, corrective actions and new guidelines. The HSE Manager will look at methods of ensuring continual improvement over the duration of operations, focusing on incorporation of lessons learnt.

8.7 Emergency Management

The Wandoo Emergency Response Plan (ERP) [VOG-2000-RD-0017] provides details on the response arrangements and responsibilities VOGA has for the management of emergencies which may occur during drilling activities. Incidents are categorised in relation to the response required:

- **Level 1 incidents**: Generally able to be resolved through the application of local or initial resources only (e.g. first strike response).
- **Level 2 incidents**: More complex in size, duration, resource management and risk and may require deployment of jurisdictional resources beyond the initial response.
- **Level 3 incidents**: Characterised by a degree of complexity that requires the Incident Commander to delegate all incident management functions to focus on strategic leadership and response coordination and may be supported by national and international resources.

More detailed response plans have been developed to address particular events (e.g. the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016]).

8.7.1 Emergency Training, Testing and Drills

Emergency response training will be undertaken including training workshops and exercises to ensure the team understands their roles and responsibilities.

Prior to the commencement of operations on each drilling campaign, an emergency response exercise will be undertaken to verify communications arrangements and evaluate personnel responses.

VOGA require MODU contractor personnel with job classifications of derrick-man and above and its Drilling Superintendent and Drilling Supervisors to maintain current well control training certification.

The VOGA WCMS has requirements for MODU well control training drills, including:

- Kick response drills both during drilling operations and tripping operations
- Choke drills conducted prior to drilling out casing shoes to familiarise personnel with equipment usage.

8.7.2 Wandoo Field Source Control Emergency Response Plan

The Wandoo Field Source Control Emergency Response Plan (SCERP) is focused on source control for wells. The plan provides campaign-specific details relating to reservoir conditions, blowout taskforce team structure, and logistics. The purpose of the document is to have as much planning as possible conducted upfront to minimise the response time of remedial measures.

There are several generic phases to bring an uncontrolled hydrocarbon release under control:

- Phase 1: Initial response, convene drilling ICT and gather information
- Phase 2: Determine most efficient well kill method
- Phase 3: Detailed planning of the well kill operation
- Phase 4: Execute well kill operation
- Phase 5: Clean-up operation
- Phase 6: Incident Investigation.

Source Control arrangements are further described in Section 5.16.3.1.

8.8 Oil Pollution Response

8.8.1 Overview

The implementation strategy must contain an OPEP and provide for updating the OPEP. The OPGGS(E)R outlines the requirements for the OPEP which must include adequate arrangements for responding to and monitoring oil pollution. As part of the implementation strategy, VOGA has developed an Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].

8.8.2 Spill Management Arrangements

8.8.2.1 Jurisdictional Authority

The jurisdictional authority is the State, Territory or Commonwealth agency with jurisdictional authority for marine pollution in its area of jurisdiction. NOPSEMA is the jurisdictional authority for offshore oil and gas exploration and production activities in Commonwealth waters, while AMSA is the jurisdictional authority for vessel-based activities in Commonwealth waters.

The Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) is the jurisdictional authority for offshore oil and gas exploration and production activities in State waters, while the DoT is the jurisdictional authority for vessel-based activities in State waters and is also the Hazard Management Agency (HMA) for Marine Oil Pollution. In the event of marine pollution in State waters, the HMA (DoT) is the designated jurisdictional authority, regardless of the source.

8.8.2.2 Control Agency

The National Plan describes the Control Agency as the agency or company assigned by legislation, administrative arrangements or within the relevant contingency plan, to control response activities to a maritime environmental emergency. The Control Agency will have responsibility for appointing the Incident Controller (VOGA uses the term 'Incident Commander').

VOGA is the Control Agency for oil spills wholly confined to Commonwealth waters from activities in the Wandoo Field, meaning VOGA is responsible for assuming Incident Control and providing an Incident Controller (Commander). In the event that a spill has any potential to enter State waters; the WA DoT will be notified as soon as reasonably practicable. For spills arising from ships and vessels within Commonwealth waters, VOGA may undertake initial response actions and will hand over Incident Control to AMSA.

In accordance with WestPlan – Marine Oil Pollution (MOP), the Controlling Agency for a Level 1 MOP emergency in State waters resulting from an offshore petroleum activity is VOGA. The Controlling Agency for a Level 2/3 MOP emergency in State waters resulting from an offshore petroleum activity is DoT.

Cross jurisdictional response activities are those activities that arise as a result of an incident originating in Commonwealth waters and requiring DoT to exercise its HMA obligations in State waters. A partnership between VOGA and DoT is required to ensure response activities across the entire incident are carried out.

Where State waters are impacted by a Level 2/3 MOP emergency resulting from an offshore petroleum activity in Commonwealth waters, DoT will only assume the role of the Control Agency for that portion of the response activity that occurs within State waters.

Table 8-5: Control Agency by location

Spill response/ impact location	Spill source	Control agency	Relevant OPEP
Commonwealth waters	VOGA Facilities	VOGA	Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016]
	Ships and vessels	VOGA/AMSA	Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016]/National Plan
State waters	VOGA Facilities	VOGA	Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] WA DoT OPEP
		WA DoT	
	Ships and vessels	WA DoT	WA DoT OPEP

8.8.3 Interface with Other Plans

8.8.3.1 VOGA Plans

The Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] interfaces with this EP and the following VOGA plans:

- Wandoo ERP [VOG-2000-RD-0017] – This plan describes the immediate 'actions-on' for an unplanned emergency incident at one of VOGA's facilities. The Wandoo ERP is the plan that will be initially put in place to manage the immediate, life-threatening consequences of an emergency (e.g. fire, collision, etc.) and immediately mitigate, as far as possible, the consequences of these actions. The Wandoo ERP will always have primacy over other plans.
- Wandoo Field Geotechnical and Geophysical Survey EP [AUPD24001-VOG-1100-YH-0014] – The Geotechnical and Geophysical Survey EP caters for all survey activities associated with the Permit Area. The EP is developed by VOGA and accepted by the Jurisdictional Authority under the OPGGS(E)R. It identifies the environmental risks and impacts associated with the activities covered within the plan. This OPEP addresses all potential oil spill risks identified in the Wandoo Field Geotechnical and Geophysical Survey EP.
- Oil Spill Response Capability Review [VOG-7000-RH-0009] – The report provides a capability review for all oil spill response spill scenarios associated with production and drilling activities within the Wandoo Permit Area WA-14-L. The capability assessment included detailing the specification for each resource requirement (e.g. skills, vessels, equipment) and identifying what contracts and arrangements are in place, or required, to meet the resource requirements. The requirements are ascertained and assessed through workshops, surveys and review of existing contracts.
- Wandoo Field Operational and Scientific Monitoring Bridging Implementation Plan (OSM BIP) [VOG-1100-RG-0002] – This plan has been designed to interface with the Joint Industry Operational and Scientific Monitoring Framework and associated OSRL Supplementary Agreement. The OSM BIP is informed by the EP through the identification of the sensitive receptors in the Wandoo Field operating environment that could be impacted during an oil spill.

8.8.3.2 Government and Industry Plans

This OPEP interfaces with the following Australian Government, State Government and Industry plans:

Oil Spill Response Organisations (OSRO)

- Oil Spill Response Limited (OSRL)
- Australian Marine Oil Spill Plan (AMOS Plan).

Oil Spill Response Agency (OSRA)

- National Plan for Maritime Environmental Emergencies (National Plan)
- WA State Hazard Plan – Maritime Environmental Emergencies (MEE)
- WA DoT OPEP.

Third Party Vessels

- Shipboard Oil Pollution Emergency Plans (SOPEPs).

8.8.4 Approach to Response Planning

VOGA's oil spill response planning process is based on impact and consequence scenario planning which involves establishing the context and risk; evaluating, demonstrating and defining response strategies and resources; implementation; and first response, as described in Table 8-6.

The process is divided into two phases: planning (Table 8-6) and spill response. The spill response is supported by the incident action planning process. Oil Pollution Plans (OPPs) are initial IAPs based on existing impact assessments for the spill and response activities within the Wandoo Field Geotechnical and Geophysical Survey and Exploration Drilling EPs.

8.8.4.1 The Planning Phase

As outlined in Table 8-6, preparing for spills involves the following steps to achieve the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] outcomes:

- Step 1: Understanding the hazard profile.
- Step 2: Identifying parameters to assess applicable response strategies and scale of the event.
- Step 3: Identifying suitable response strategies.
- Step 4: Understanding the impacts associated with response strategies.
- Step 5: Ensuring capability and plan supports management of risks to ALARP.
- Step 6: Define the environmental performance standards within the respective EPs.

The outcome of this approach is that:

- Oil spill hazards associated with VOGA's activities are addressed and risks are managed to ALARP.
- Response strategies and resources are based on the nature and scale of the incident.
- OSTM outputs for the loss of well control and vessel collision was undertaken to identify response parameters including:
  - minimum time to impact defined environmental sensitivities
  - probability of shoreline impact to defined environmental sensitivities
  - maximum quantity of oil impact to defined environmental sensitivities
  - maximum length of oil impact to defined shoreline environmental sensitivities.
- Response strategies are risk assessed and management controls outlined in the Wandoo Field Geotechnical and Geophysical Survey and Exploration Drilling EPs are considered in this OPEP.

Table 8-6: Description of steps in oil spill response assessment (planning process)

Response planning steps
Step 1: Oil spill hazard is identified and context for each spill category and season described. This requires understanding the potential events (scenarios) which requires knowledge of: • API type, composition of reservoir/fluids assay • Reservoir modelling of oil type or another geotechnical analysis • Release rate, quantity, duration • Location of activity and potential spill sources • Metocean data matching the location and timing of activity • Location of environmental receptors and method of impact from oil • Toxicity of oil • Timing of spill (season) • Thresholds • EMBA.
Step 2: Evaluate response parameters, is also about consideration of the hazard, as response preparation requires understanding the potential consequence including: • Probability of oiling defined environmental sensitivities • Minimum time to impact defined environmental sensitivities • Quantity of oil to impact defined environmental sensitivities • Length of shoreline impacted • Response operating area.
Step 3: Define response strategies for spill categories, involves designing the most appropriate response plan, such that the impacts, in the event of a spill, are reduced to ALARP. VOGA uses an assessment process for oil spill planning and response, and in doing so consider: • The oil spill hazard • The context for each spill category and season • Operational constraints

Response planning steps
• Assess the impacts of the hazard and the response activities • Assess whether impacts from the hazard and the response activities are ALARP, by considering all alternatives and their relative benefits and costs • Where not determined to be ALARP, the response strategies are adjusted as part of an iterative process. This iterative process considers capability and in doing so looks at the potential benefits and costs of doing more sooner.
As a part of the planning the response, in **Step 4: Assess impacts of spill scenario,** VOGA also assesses the impacts of the spill response. This not only contributes to making choices about the response strategies, but also informs how the response should be undertaken to ensure that the risks and impacts of the response are managed to ALARP. This step involves: • Environmental risk and impact assessment • OSTM of surface, entrained and subsurface oil with and without response strategies • Identification of the controls (including EPOs, EPSs, and measurement criteria) to be implemented as a part of the spill.
To ensure that VOGA has a level of preparedness to implement the response strategy **Step 5: Define the response resources** is undertaken next. In this step, VOGA considers: • Operational limitations (equipment functional capacity/coverage, safety of response personnel) • Constraints of equipment effectiveness • Scale of the spill event • Skill-sets required for specific roles.
Step 6: Define the performance standards.

8.8.4.2 Spill Response Phase

Initial response actions are described in the OPPs. These actions are based on the strategies, resources and capability identified in the planning process. Resources are activated and the outputs from monitoring and evaluation are used to conduct an impact assessment, SIMA, to confirm that the risks associated with response activities are consistent within the two EPs and the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] (Appendix E). If they are, then response effectiveness KPI are developed, and response measures implemented. The incident action planning process provides for the opportunity to determine if response operations are effective and if termination criteria are met.

The incident action planning process used by the ICT allows for the effectiveness of each strategy to be reviewed, adjusted or halted if the objectives of the response are not being met or the environmental impacts were not addressed in the SIMA, thus fulfilling Outcome 3 of the OPEP. If the impact of a response strategy is significantly higher than what is considered in the EP, then this means either impact of the strategy is unacceptable, or an EP revision is required for acceptance. An example of where a revision to an EP may be required is where new technology such as that for in-situ burning or bioremediation becomes available to VOGA.

To support this approach and provide a timely response, OPPs detail an initial IAP enabling response resources to be activated whilst event specific assessments are conducted. Resources are identified and capability to achieve timeframes has been reviewed to ensure first response actions are able to be implemented.

8.8.5 Incident Management Process

8.8.5.1 Response Structure

VOGA has an emergency management response structure that is based around three levels of organisational control: tactical, operational and strategic. The premise behind these levels of control is that those parties within VOGA with the greatest expertise to manage that aspect of the emergency are empowered to do so, with operational or strategic levels stood up to provide support in terms of planning, resources and the management of extraneous issues that while important, are managed at the lower levels of control.

There are three teams within the emergency management response structure including the:

- Corporate Command Team (CCT)
- Incident Command Team (ICT)
- On-site ICT.

The goal of the three teams within the VOGA emergency management response structure is to implement reasonable and proportionate oil spill response strategies until such time as the oil spill response may be terminated.

The teams will do this by implementing a six-step incident response cycle. Prudent over-caution is used by VOGA in responding to oil spills, i.e. CCTs and ICTs will be notified with a view to being stood up for oil spills, then stood down after size and scale have been assessed and verified.

The chain of command for incident response is depicted within the VOGA emergency management response structure, as presented in Table 8-7. Personnel appointed to these functions are selected from within VOGA or, for protracted incidents that run for weeks or months, using trained National Response Team members, AMOSC and the AMOSC Core Group, international oil spill response support organisations, and from within the international resources of VOGA. Where required the DoT Incident Controller has input into the team composition and structure.

Table 8-7: Key ICT functions for oil spill response

Role	Functional responsibilities
VOGA Incident Commander/ICT Leader	First point of contact for Person in Charge (PIC) offshore. Assists PIC to manage the response and calls out the ICT if required. Responsible for ensuring that an effective response is mounted by the On-site Command Team, and the onshore ICT. Approve IAP and where required engage State Maritime Environmental Emergency Coordinator/DoT Incident controller for agreement/endorsement of plan for activities within, or potentially impact, WA waters.
DoT Incident Controller (Hazard Management Agency) and State Maritime Environmental	DoT Incident Controller (Hazard Management Agency) is the State appointed incident controller for oil spill response activities within, or potentially impact, WA waters. The State Maritime Environmental Emergency Coordinator provides overall strategic management of the response and executive level support and guidance to the DoT Incident Controller.

Role	Functional responsibilities
Emergency Coordinator	
Planning Chief Situation Resources Environment	Supervises the VOGA ICT and leads the IAP process. Records and displays data for information, planning and programming, allocation and justification. Documents and maintain records of all Wandoo Offshore Installation and VOGA ICT actions. Manages critical information requirements.
	Interfaces with State Maritime Environmental Emergency Coordinator or State Environmental and Scientific Coordinator (ESC) for input into IAP for activities impacting state waters.
	The collection, processing and organisation of operational monitoring information, e.g. OSTM, weather, sea state.
	Tracking of the deployment of resources.
	Responsible for the collection and collation of environment data/advice, e.g. obtains environmental data from OSRA and scientific monitoring (DoT ESC and local sources) with support from an Environment Unit Lead role.
Logistics Chief Procurement Services Transport Communications Medical	Develops logistics plan to support operations and provides overall resource support to emergency incident sites. Establishes and maintains lists of personnel, supplies and materials which might be required to support the emergency/disaster. Responsible for establishing any SIMOPS Plan to manage the risk generated by multiple activities.
	Acquisition of personnel and equipment.
	Acquisition of services and facilities, including waste management resources.
	Provision of air, land and sea transport services.
	Communications Sub-Plan and for ensuring the provision of communications services/support.
	Provision of medical services where needed.
Operations Chief Marine Aviation Shoreline Wildlife Occupational Health & Safety (OH&S) Waste management	Assumes responsibility for executing approved Action Plans. Responsible for all tactical command and coordination of in-country incident response assets in the assistance and support of the On-site Commander. Ensures that operational objectives and assignments identified in Action Plans are carried out effectively. Monitors operations; ensures necessary operational support is provided when and where required; allocates resources.
	Coordination and direction of all activities undertaken by waterborne craft and equipment.
	Coordination and direction of all activities undertaken utilising aircraft, e.g. aerial dispersant spraying, aerial surveillance and transport.
	Planning and coordination of shoreline assessment and cleanup activities (in consultation with the DoT, planning, specifically the environmental specialists). Implementation of shoreline cleanup activities.
	Implementation of the WA Oiled Wildlife Plan, i.e. the collection, treatment and rehabilitation of oiled wildlife in consultation with Department of Biodiversity, Conservation and Attractions (DBCA) via the DoT ESC.
	Development and implementation of the OH&S Plan.

Role	Functional responsibilities
	Coordination of the containment, storage, transport and disposal of recovered oil and oily waste. Also, instruction in on-site handling, storage and/or separation and treatment.
Finance Chief	Provides monetary, insurance, legal, risk and human resources, related administrative functions to support emergency operations and to preserve vital records documenting work performed and associated costs in the event of disaster or major emergency.
Safety Officer	Assesses unsafe situations and develops measures for assuring personnel safety. Confirms safety regulatory authorities and applicable departments have been notified. Ensures implementation of safety measures and monitoring and recording of personnel exposures to hazardous products. Supports accident investigations, recommends corrective action, and prepares accident report.
CCT	Focus of the CCT is on ensuring ICT are responding in accordance with corporate requirements, liability/insurance, business continuity, media/investor relations, and financial management/support of response.
Corporate Command Operations Chief	Provides the interface between the ICT and CCT. Provides updates to the CCT regarding IAPs and communicates any needs for support if required. Responsible for ensuring VOGA's corporate objectives are communicated to the ICT and are also reflected in the IAP.
Stakeholder Liaison Officer	Responsible for managing regulatory engagement and coordinating any regulatory approvals required to implement response strategies. Coordinates engagement of stakeholders who are impacted from the spill or response activities. Coordinates investigation of reportable events. Acts as the functional interface between these various parties. Implements VOGA Communications Plan, providing media information support and serving as the dissemination point for all VOGA media releases.
Liaison Officer (Industry)	Identifies the assisting and cooperating companies and agencies, including communications link and location; provides list to the CCT. Functions as "point of contact" for assisting and cooperating agency representatives. Responsible for ensuring that parties who have agreed to undertake specific functions under the OPEP are undertaking the functions consistent with the oil spill response strategies, performance standards and objectives of the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].

8.8.5.2 ICT Response Resources

VOGA engaged a third-party expert to research and provide an appropriate method that could be used for VOGA to determine the level of ICT personnel required to undertake an effective response to VOGA's identified oil spill events. In summary, the research identified that:

- Other emergency management frameworks in Australia:
  - did not have a publicly available method of quantifying the numbers of ICT personnel required to respond to incidents
  - relied on the scalability of the ICS system with a focus on the minimum competence of staff to fill critical positions.

- Spill response case studies provide minimal instruction or value in determining the level of ICT personnel to support an oil spill cleanup because:
  - different jurisdictions have different national response frameworks with some being led by government, others by industry, and others cooperatively
  - often the numbers of ICT staff are reported without any indication of the prior competence or training of personnel
  - no correlations could be drawn between the response strategies employed in a response and the level of ICT staffing required to support a particular strategy
  - there are too many variables (e.g. spill size, location, release point, personnel competence, environment effected, population density, political pressure) to be able to reasonably allocate case study ICT personnel numbers to any other situation.
- The only correlations across case studies could be that:
  - cooperative national frameworks, such as those in Australia, tend to rely on lower overall ICT personnel numbers with a focus on ensuring minimum levels of competence are required for critical roles.
  - spills at locations with higher population densities tended to engage higher numbers of ICT personnel.
- In Australia, the National Plan relies on fewer numbers of highly competent and broadly qualified individuals who can operate in a cooperative national system for its response operations. This is demonstrated by the training syllabus in the AMSA administered national oil spill response qualifications.

Based on this research VOGA has decided that to be consistent with the National system for oil spill response in Australia, a methodology based primarily on ensuring competence personnel are positioned in the critical roles is the most appropriate for its activities.

8.8.5.3 Source Control Technical Support Teams

In the event of a well control incident the VOGA ICT are responsible for managing the response in accordance with the SCERP. The ICT will be based in the VOGA Perth office and supported on technical aspects by dedicated technical support teams.

The Incident Commander will authorize the assembly of the following dedicated technical teams to undertake the well kill and relief well planning and execution activities:

- Well Control Response Team
- Subsurface Team
- Relief Well Planning Team.

Each of these teams will be under the direction of the Well Construction Manager who will report to the Incident Commander to ensure a clear chain of command.

These teams will consist of VOGA personnel and/or potentially service contractors, dependent on the well control event category and if the event occurs during drilling or well intervention programs.

VOGA has a consultant based offshore drilling team available during drilling campaigns that could be utilised for drilling a relief well. There are several consulting firms in Perth who specialise in the supply of suitably qualified personnel at short notice if VOGA decide more engineering support is required in their office or for offshore supervision.

VOGA has the option, with its international offices, to call on additional internal engineering support. VOGA's Perth office has agreements in place with most major service companies for equipment and personnel and can draw on a range of specialised personnel to assist in blowout response.

The competency level required of the technical teams is described in Section 8.3.6.

8.8.6 Assurance and Capability Management

The key performance and assurance activities are:

- Training and competency
- Exercises
- Inspections and audits.

These activities can either be conducted internally or by a third party, including another titleholder, equipment/resource provider or oil spill response agency.

Exercises enable the IAP processes, team interfaces and equipment deployment to be tested to enable continuous improvement of response planning or third-party expertise. Exercises can either be desktop, simulated events or full-scale equipment deployment.

Inspections and audits are conducted to test and provide assurance to assumptions and commitments made within this plan and capability assessment.

8.8.6.1 Training and Competency

Element 5 of VOGA's HSE MS is training and competency and within that element, the Personnel Selection, Placement and Competency Assurance [VOG-1100-YG-0501] outlines how VOGA manage the training of personnel. Onsite emergency response personnel are trained in emergency control and leadership to ensure they are suitability prepared for decision-making in an emergency situation.

Training requirements are identified for Onsite Command and Incident Command teams to ensure rotate testing of scenarios and equipment. Records are is kept to track the and completed training of personnel.

Each member of VOGA's ICT will have completed incident management training as outlined in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016], giving them basic competencies and therefore requisite skills to undertake their required incident response roles. At a minimum, this means a course in ICT management for ICT members, with planning, operations, logistics, finance chief roles, and Incident Commanders having completed a training course in ICT command and control.

8.8.6.2 Exercises

The Wandoo ERP [VOG-2000-RD-0017] ensures that strategies are in place in to manage emergencies. The VOGA Emergency Response Schedule [VOG-1100-YH-0001] addresses the scope and requirements for conducting exercises for the onsite and incident command teams.

Exercises are part of the training standards identified in the VOGA Emergency Response Schedule include:

- Onsite command exercises (Level 1) – An exercise that involves the onsite command team scenario of any severity (may be conducted as a desktop exercise).
- ICT exercises (Level 2) – Exercise of any severity, must involve exercising the ICT with an IAP being generated (may be conducted as a desktop exercise) and may involve one or more organisations or external agencies.
- Crisis Management (Level 3) – An exercise of any severity that involves Corporate Command Team whose focus is on business continuity and media/investor relations. For these exercises, a corporate communications and business continuity plans may be prepared.

VOGA uses exercises to demonstrate the ability to fulfil its roles and responsibilities in terms of emergency response to all incidents including oil spill incidents. The overall aim of exercises is to drive continual improvement through:

- Providing situational experience for ICT personnel and enabling them to be aware of their assigned roles and responsibilities during a response
- Assessing the effectiveness, achievability and timeliness of incident action planning for the duration of expected response
- Testing interfaces between teams and deployment of equipment and resources.

The VOGA Emergency Response Schedule [VOG-1100-YH-0001] provides details regarding the reporting of recommendations arising out of exercises including changes of procedure, corrective actions and new guidelines.

8.8.6.3 Inspections and Audits

Overview

VOGA's auditing schedule includes all elements of VOGA's HSE MS, including environment performance. The auditing schedule includes three types of auditing processes:

- Internal inspections of VOGA's response capabilities and commitments.
- External inspections of VOGA's response capabilities and commitments.
- Inspections of third-party providers.

Inspections of VOGA Commitments

HSE MS compliance audits are conducted regularly to review management standards relating to Management, Leadership and Policy, Risk Assessments and Case to Operate, MoC, Training and

Competency, Emergency Preparedness (including OPEPs), Management and Response, and Incident Management.

VOGA's auditing schedule includes all elements of VOGA's HSE MS, including environment performance. The auditing schedule includes three types of auditing processes:

- Internal audits are conducted by relevant VOGA stakeholders such as the Managing Director, Well Construction Manager and/or HSES Advisor and are focused on VOGA systems, processes and resources
- External audits are conducted by a third-party provider and are considered a "deep dive" auditing process that reviews the system design completeness and adequacy, implementation adequacy and effectiveness
- Contractor audits are focused on the activities managed by the contracting party.

Inspections of Third Party Providers

The inspection of third party providers is focused on confirming that systems and processes are in place to meet response expectations within some or all of the following areas:

- Equipment: maintenance management, logistics, training, readiness for activation/ deployment
- People: training and competency management, quantity and availability
- Activation process: notification processes, activation and mobilisation of people and equipment, exercises and testing
- Documentation: contracts, agreements, specialist services, authorisation lists, capturing of learning and input into training materials
- Management and organisation: organisational MoC process, lessons learnt, contracts and liability.

The frequency of the inspection is dependent on VOGA's activity, requirements of mutual aid partners and size/capability of the organisation and is provided in the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].

8.9 Inspection and Auditing

8.9.1 Audit Process

The VOGA audit procedure is outlined in the Performance Assessment Manual [VOG-1100-YG-1201]. The audit process comprises:

- Audit scheduling
- Preparation and planning
- The audit
- Reporting
- Follow up and action item close-out.

8.9.2 Inspection Process

Inspection of equipment and processes are a means by which VOGA collect records pertaining to technical status of contractor equipment and compliance with certain environmental performance standards. The inspection process is similar to, but less formal than, the audit process.

8.9.3 Inspections and Audits

Internal and external inspections and audits will be undertaken to confirm that commitments specified within the Commitments Register are being met.

Internal inspections and audits are conducted by VOGA personnel. Internal inspections and audits range from regular small area specific inspections conducted by field supervisors through to high level management audits focused on a single major accident event or an environmental event assessed to have a 'Catastrophic' impact under the VOGA risk matrix or HSES topic. These inspections and audits assess compliance with the HSE MS, including the performance outcomes and standards specified within this EP.

External inspections and audits are conducted by third party service providers with specific expertise to provide an independent evaluation of compliance with the HSE MS expectations and performance standards and outcomes.

8.9.4 Inspection and Audit Plan

VOGA develops a specific audit plan for each drilling campaign, optimised to meet that campaigns specific requirements. The audits and inspections outlined in Table 8-8 will be carried out during each drilling campaign.

Table 8-8: Audits and inspections proposed for each drilling campaign

Timing	Inspection audit objective	Frequency	Internal/external
Planning and design phase	Pre-campaign inspections on MODU and AHTS vessels to verify preparedness for work including compliance with EP requirements.	Per campaign	Internal
	Pre-campaign EP compliance review to ensure compliance with commitments relating to this phase.	Per campaign	Internal or external
Execution	EP compliance audit.	Per campaign	Internal or external

8.9.5 Follow-up and Action Item Close Out

Following receipt of the Audit Report, the Well Construction Manager should undertake a review and develop an Action Plan. The Action Plan should finalise:

- Action items
- Action parties
- Timeframe for completing action items

- Approver.

The appropriate actions need to be taken by the designated action parties within the agreed timeframe. The process for closing out actions is detailed in the Performance Assessment Manual [VOG-1100-YG-1201]. Additionally, compliance auditing of the Commitments Register will allow for activity non-conformances to be identified, captured and tracked via the Performance Assessment Manual - Performance Assurance [VOG-1100-YG-1201.02]. For non-conformance and MoC see Section 8.5.

8.10 Reporting

8.10.1 Routine Reporting

8.10.1.1 Statutory Reporting

Regulation 22 of the OPGGS(E)R require titleholders to include arrangements in the EP for:

- Maintaining a quantitative record of emissions and discharges to the air, marine, seabed and sub-seabed environment to enable evaluation of performance against performance standards and measurement criteria.
- Recording, monitoring and reporting information about the activity (including information required to be recorded under the OPGGSA, the regulations and any other environmental legislation applying to the activity) sufficient to enable the Regulator to determine whether the EPOs and EPSs in the EP are met.
- Reporting to the Regulator at intervals agreed with the Regulator, but not less than annually.

A report of these parameters will be submitted to NOPSEMA at the end of each campaign by the VOGA HSES Advisor. If no activity has occurred in any given year, this will also be notified to NOPSEMA fulfilling the requirement for annual reporting.

VOGA has legal obligations under the OPGGS(E)R to submit routine reports to NOPSEMA as well as notify NOPSEMA of an incident within a specified period, depending on the impact or potential impact to the environment and whether the incident is deemed reportable or recordable under the OPGGS(E)R (Section 8.10.3).

In addition, VOGA must notify NOPSEMA of a change in the following in accordance with Regulation 23(3):

- The titleholder of WA-14-L
- The titleholder’s nominated liaison person for the activity, or
- A change in contact details for either the titleholder or the nominated liaison person.

8.10.1.2 Routine Internal Reporting

A number of routine internal reports will be prepared during each campaign, including:

- Daily Drilling Reports: prepared by the VOGA Drilling Supervisor and issued to key support personnel and stakeholders. Daily Drilling Reports outline performance information on

drilling activities completed over the previous 24 hours, QHSE, logistics, equipment and fuel usage.

- The seven-day look-ahead (issued daily by the VOGA Drilling Supervisor) provides a forward projection of activities over the coming seven days and identifies AHTS vessel and helicopter movement and equipment and personnel requirements. Relevant internal reports will be collated and maintained by VOGA's HSES Advisor and will inform the preparation of external routine reports, as described below.
- An environmental discharges log is maintained by the VOGA Offshore Materials Coordinator. This log is a consolidation of data from several sources to enhance accessibility.

8.10.1.3 Routine External Reporting

VOGA reports information on environmental performance to regulators as outlined in Table 8-9.

Table 8-9: External routine reporting requirements

Report	Recipient	Frequency	Content
Activity Commencement/ Completion Notification (Regulation 29)	NOPSEMA	At least 10 days prior to an activity commencing and within 10 days after completion using form N-04750-FM140.	Notification that an activity is to commence at least 10 days prior or notify that an activity has been completed.
End of Well Report	NOPSEMA	Within three months of completion of activities.	In accordance with the OPGGS(E)R, confirmation of compliance with the supplementary Performance Standards.

8.10.2 Internal Incident Reporting

The Wandoo Event Management Manual [VOG-2000-MN-0003] outlines the reporting requirements:

- Incidents: All incidents that result in a loss must be reported using an approved Incident Investigation Report Form (e.g. injuries, damage to assets, spills and releases, corporate reputation and near misses).
- Investigation Report Form: For drilling operations, VOGA reviews the incident reporting process of the MODU Contractor. If the MODU Contractor's process is compliant with the VOGA system, then the MODU Contractor's reporting process is used in preference to VOGA's to minimise the volume of reporting. VOGA provides members to any team conducting formal investigations of major incidents.
- Non-Compliance Incidents: VOGA's Incident Report Form must be completed and submitted, whenever a non-compliance event is reported to a regulator.
- Regulatory Audits and Inspections: The results of all regulatory audits and inspections are to be reported by site supervisors.
- Hazard Alert/Near Miss Reports: It is expected that all near misses are reported, and all high-potential hazards are investigated and reported, using the Incident Report Form.

- Hazard Observations: To encourage the reporting of near misses, VOGA uses a simplified reporting form. It is expected that all high-potential hazard alerts and close calls will be investigated, and reported, using VOGA's Incident Report Form (or the MODU Contractor's if compliant with VOGA's system).
- Public Concerns and Complaints: Incidents involving the public in the communities near VOGA operations should be treated as serious and reported using the Incident Report Form.

All near-misses, hazard identifications, incidents, regulatory compliance inspections, and associated action items, must be entered into VOGA's event tracking system within 24 hours of the occurrence. All incident investigation reports must be complete within 5 business days for high and extreme risk (potential and actual) events, up to 10 business days for all others.

8.10.3 External Incident Reporting

8.10.3.1 Reportable Incidents

The OPGGS(E)R defines a reportable incident as *"an incident relating to the activity that has caused, or has the potential to cause, moderate to significant environmental damage."*

Reportable incidents are identified through the risk assessment process for a reported event and comprise any event with a potential consequence to an ecosystem or environmental asset of 3 (moderate) or greater, i.e. 4 (major) and 5 (catastrophic), regardless of the overall risk level assigned. The consequence ratings are based on VOGA Risk Management Manual [VOG-2000-MN-0001] corporate risk matrix using the ecosystem/environmental asset impact criteria.

For campaign these include:

- Introduction of invasive marine species from AHTS vessel/MODU (EP-ED-R11)
- Accidental release of MDO (EP-ED-R14)
- Loss of well control (EP-ED-R15).

NOPSEMA, NOPTA and the Department of the responsible State Minister are to be notified of all reportable incidents in accordance with the following requirements of the OPGGS(E)R:

- Notify NOPSEMA orally of a reportable environmental incident as soon as practicable but not later than 2 hours after the first occurrence of the incident or after the time that the titleholder becomes aware of the incident
- Provide a written record of the notification to NOPSEMA, the Titles Administrator and the Department of the responsible State or NT Minister as soon as practicable after the oral notification
- Provide NOPSEMA a written report of a reportable incident as soon as practicable but not later than three days after the first occurrence of the incident
- Provide a copy of the written report to both the Titles Administrator and the Department of the responsible State Minister within seven days of giving the written report to NOPSEMA.

The written report must contain the following information:

- All material facts and circumstances concerning the reportable incident that the titleholder knows or is able, by reasonable search or enquiry, to find out
- Any action taken to avoid or mitigate any adverse environment impacts of the reportable incident
- The corrective action that has been taken, or is proposed to be taken, to stop, control or remedy the reportable incident.

8.10.3.2 Recordable Incidents

The OPGGS(E)R defines a recordable incident as *"a breach of an environmental performance outcome for the activity or an environmental performance standard relating to the activity, that is not a reportable incident"*. Recordable incidents are reported to NOPSEMA on a monthly basis.

Written reports of all recordable incidents will be reported to NOPSEMA in compliance with Regulation 50 of the OPGGS(E)R and will:

- Relate to a calendar month
- Be given as soon as practical after the end of the calendar month, and not later than 15 days after the end of the calendar month
- Will include all the information as required under Regulation 50 of the OPGGS(E)R.

Table 8-10: Incident reporting

Incident	Reporting requirement and KPI	Responsibility
Reportable Incident (Regulations 47, 48, 4)	Verbal or written notification must be undertaken within 2 hours of the incident or as soon as practicable to NOPSEMA. NOPSEMA written report.	VOGA HSES Advisor
Recordable Incident (Regulation 50)	Monthly, by 15th of each month to NOPSEMA.	VOGA HSES Advisor
A pollution incident that occurs within a marine park or is likely to impact on a marine park	Report verbally to the DNP (24-hour) Marine Compliance Duty Officer as soon as practicable, and also provide a follow-up email. • Phone: 0419 293 465 Email: marine.compliance@environment.gov.au	VOGA HSES Advisor
Death or injury to individual(s) from an EPBC Act Listed Species as a result of the petroleum activity	As per EPBC condition 26e (EPBC 2008/4469), report injury to or death of EPBC Act Listed Threatened or Migratory species within 1 business day of observation to DCCEEW. • Phone: +61 2 6274 1111 • Email: EPBC.Permits@environment.gov.au	VOGA HSES Advisor
Vessel collision with marine mammals	Reported as soon as practicable to • https://data.marinemammals.gov.au/report/shipstrike	VOGA HSES Advisor
Presence of any suspected IMP or disease	Within 24 hours to DPIRD: • Email: biosecurity@fish.wa.gov.au • Phone: FishWatch 24-hour hotline: 1800 815 507	VOGA HSES Advisor

Incident	Reporting requirement and KPI	Responsibility
Unplanned release that is expected to impact land or water within Western Australian State jurisdiction	Reported as soon as practicable. • petroleum.environment@DEMIRS.wa.gov.au	VOGA HSES Advisor
Records of complaints from fishermen or other users	MODU and AHTS vessel radio logs document interactions with other sea users.	AHTS vessel masters and MODU OIM
Records of breaches of restricted zone by fishermen or other	MODU and AHTS vessel daily logs record breaches.	AHTS masters vessel and MODU OIM

Section 9 Relevant Person Consultation

9.1 Overview

The relevant person consultation process enables VOGA to provide sufficient information and a reasonable period of time to allow each relevant person to make an informed assessment of the possible consequences of the proposed activity on their functions, interests, or activities.

Consultation also ensures the activity is undertaken in a manner consistent with the OPGGS(E)R to ensure the environmental impacts and risks are As Low as Reasonably Practicable (ALARP) and are acceptable.

Consultation with relevant persons began in October and November 2024 in accordance with Regulation 25 of the OPGGS(E)R. It builds on previous consultation undertaken with relevant persons to support the ongoing activities of VOGA's operations. VOGA's consultation record is at Appendix F.

9.2 Consultation Approach

VOGA's core values of excellence, trust, respect, and responsibility have underpinned the consultation process. In developing its approach to consultation and throughout the process, VOGA has also ensured it responds to:

- Regulation 25 of the OPGGS(E)R
- NOPSEMA guidance, specifically NOPSEMA's latest EP Consultation Guidelines (20 May 2024)
- Government and industry guidance, as described in Section 9.2.3
- Applicable case law (Santos v *Tipakalippa*), as described in Section 9.2.4.

VOGA's approach is also consistent with the principles of the Ecologically Sustainable Development (ESD) outlined in Section 3A(a)–(e) of the EPBC Act.

9.2.1 OPGGS(E)R Consultation Requirements

VOGA has considered the OPGGS(E)R for its consultation program as appropriate.

Regulation 25 of the OPGGS(E)R describes a titleholder's obligations when preparing a new EP or revising an existing plan. The regulations require titleholders to engage with 'relevant persons' including Commonwealth, State, or Territory agencies or authorities; the Department of the responsible State Minister; people or organisations which have functions, interests or activities which may be affected by the titleholder's activities carried out under the EP; and any other people or organisations the titleholder considers relevant.

Regulation 25 requires each relevant person be given sufficient information and a reasonable period for consultation to make an informed assessment of the consequences of the

titleholder's activities on their functions, interests or activities. Additionally, the titleholder must inform each consulted relevant person that they can request certain information to remain private, and such requested information will not be published.

9.2.2 NOPSEMA Consultation Guideline

VOGA's consultation approach, process, and activities have been developed in accordance with relevant regulations, NOPSEMA guidelines, and guidance notes as well as other government and industry guidance as listed below:

- *Consultation in the course of preparing an environment plan* – GL2086 A900179 – 20/5/2024
- *Responding to Public Comment* – GN1847 A662607 – 10/1/2024
- *Consultation with Commonwealth agencies with responsibilities in the marine area* – GL1887 A705589 – 21/11/2024
- *Environment Plan decision making* – GL1721 A524696 – 10/1/2024
- *Environment Plan Content Requirement* – GN1344 A339814 10/1/2024
- *Petroleum activities and Australian Marine Parks* – GN1785 A620236 – 10/1/2024.

9.2.3 Government and Industry Guidance

Consultation approach, process, and activities have also been developed in accordance with other government and industry guidance, including:

- Australian Fisheries Management Authority – Petroleum industry consultation with the commercial fishing industry
- Australian Heritage Commission – Ask First – A guide to respecting Indigenous heritage places and values
- International Association for Public Participation – Principles for Engagement with Communities and stakeholders
- DCCEEW: Sea Countries of the North-West; Literature review on Indigenous connection to and uses of the North-West Marine Region
- DCCEEW: Draft Guidelines for working in the near and offshore environment to protect Underwater Cultural Heritage – 2023
- WA Department of Transport – Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements – July 2020
- WA Department of Transport – WA Incident Management Plan – Marine Oil Pollution, September 2023
- Western Australian Fishing Industry Council – Commercial Fishing Consultation Framework for the Offshore Oil and Gas Sector, July 2023
- Western Australian Fishing Industry Council – Consultation Approach for Unplanned Events
- International Standards Organisation – ISO14001:2015 Environmental Management Systems Environmental management systems – requirements with guidance for use
- International Finance Corporation Performance Standard 7 – 2012.

9.2.4 Applicable Case Law and Guidance

In shaping its approach and process to consultation, VOGA carefully considered judgments handed down in both the Federal Court and the Full Court of the Federal Court, with respect to environmental plans, which underscored the importance of conducting genuine consultations. These judgements reinforced that communication with relevant stakeholders must be open and effective, the process must be transparent, and further anchored in principles of collaboration, inclusiveness, and integrity.

The Full Court's decision in Santos v *Tipakalippa* (*Tipakalippa*) (Federal Court of Australia, 2022) has set a clear precedent for titleholders, establishing standards that have since been incorporated into NOPSEMA's current guidelines. *Tipakalippa* affirms that there is no 'one-size-fits-all' approach to consultation. Instead, consultation strategies must be tailored to reflect the specific interests of each relevant party and must go beyond superficial or tokenistic engagement. The judgement also placed particular emphasis on the need for meaningful consultation with First Nations groups, affirming that the right to be consulted is substantive and must be respected as such (Ashurst, 2023).

VOGA has been conscious of these requirements in establishing and implementing its consultation process.

9.2.5 Consultation Summary

VOGA undertook a comprehensive approach to identify relevant persons and implemented a robust consultation process in keeping with the NOPSEMA's guidance which focuses on the instructive reasons outlined in *Tipakalippa*.

The guideline deals with matters that should be considered when designing and implementing consultation processes and provides interpretations contained in Regulation 25 of the OPGGS(E)R. Further, it provides a summary of the Full Court of the Federal Court's interpretation of 'functions', 'activities' and 'interests' to assist titleholders to identify relevant persons.

Throughout the preparation of this EP, VOGA has undertaken consultation in compliance with Regulation 25 of the OPGGS(E)R by:

- Consulting with each of the following relevant persons while preparing this EP:
  - each Commonwealth, State or Northern Territory agency or authority to which the activities to be carried out under the environment plan may be relevant
  - if the plan relates to activities in the offshore area of a State—the Department of the responsible State Minister
  - if the plan relates to activities in the Principal Northern Territory offshore area—the Department of the responsible Northern Territory Minister
  - a person or organisation whose functions, interests or activities may be affected by the activities to be carried out under the EP
  - any other person or organisation that the titleholder considers relevant (Regulation 25(1) of the OPGGS(E)R).

- Giving each relevant person sufficient information to allow the relevant person to make an informed assessment of the possible consequences of the activity on their functions, interests or activities (Regulation 25(2) of the OPGGS(E)R).
- Allowing the relevant person a reasonable period for the consultation (Regulation 25(3) of the OPGGS(E)R.
- Telling each relevant person that the titleholder consults with, that the relevant person may request that particular information it provides in the consultation note be published and any information subject to such a request is not to be published (Regulation 25(4) of the OPGGS(E)R).

9.3 VOGA's Consultation Methodology and Process

9.3.1 Overview

VOGA has undertaken extensive research to inform its methodology, process and approach, referencing various guidelines, standards, and relevant information on planned activities. VOGA applies guiding principles to its methodology for discharging its obligations under Regulation 25 of the OPGGS(E)R and has developed a consultation methodology for its process. See Table 9-1 for our guiding principles for consultation and Figure 9-1 for an overview of VOGA's consultation methodology and process.

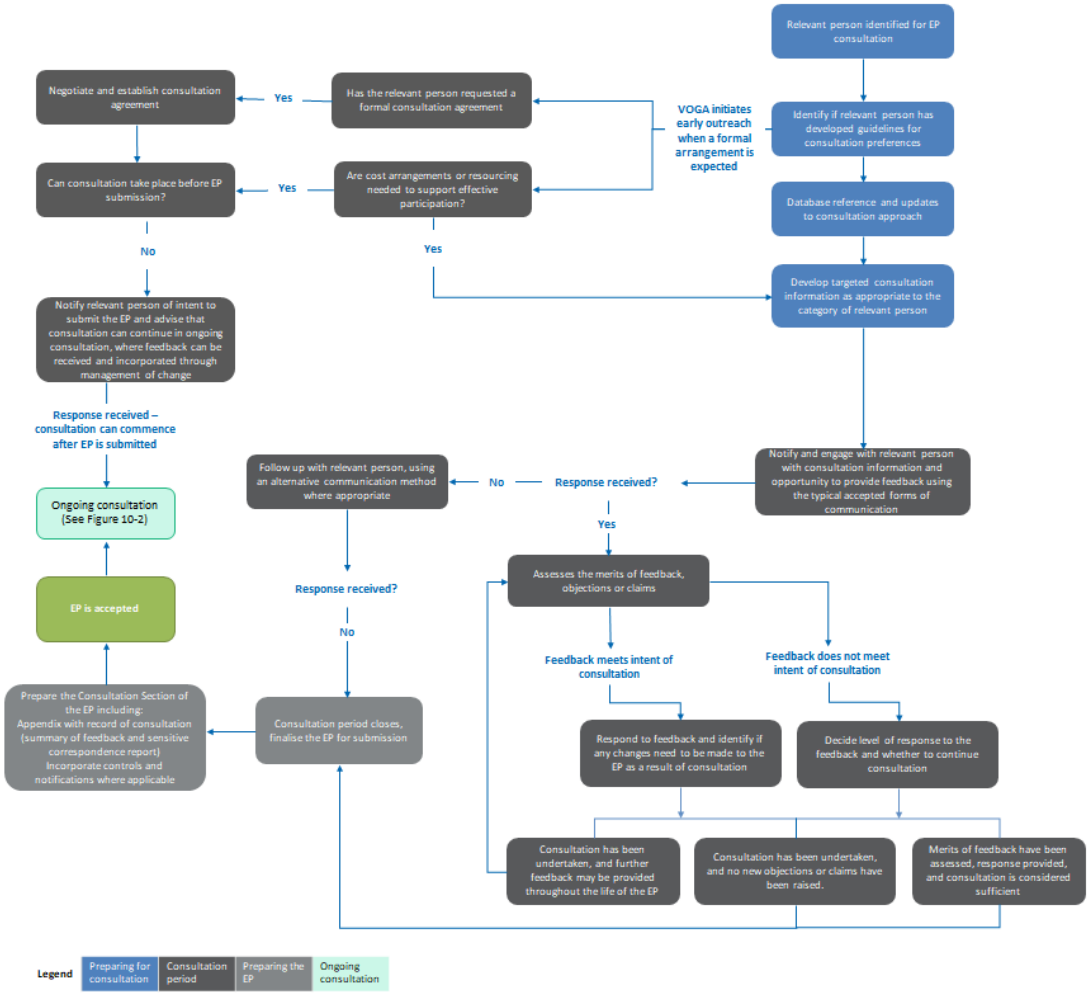
Table 9-1: Guiding principles for consultation

Guiding principle	Key concept
Consultation processes must be designed in the context of the objects of the OPGGS(E)R (NOPSEMA, 2023).	Consistent with the principles of ecologically sustainable development set out in Section 3A of the EPBC Act. Intended to reduce the environmental impacts and risks from the activity to ALARP and at an acceptable level.
Collaborative and provides opportunities for relevant persons to engage and provide feedback on the EP, through formal and ongoing consultation processes.	Consistent with general principles for effective consultation and literature, and guidelines or guidance issued by relevant persons. Consultation should be undertaken in good faith between titleholders and relevant persons, with a free and open exchange of information to inform appropriate environmental impact assessment (Parliament of Australia, 2023).
A person required to be consulted under Section 25 needs to be more than a member of the public who is generally concerned with or interested in the activity (Parliament of Australia, 2023).	Consultation on offshore petroleum activities is a two-way process where information is shared between titleholders and relevant persons (NOPSEMA, 2023a).
Section 25 requires consultation with relevant persons; however, it does not require consent for an activity to be given by any relevant person (Parliament of Australia, 2023).	Titleholders are not required by law to obtain agreement or consent from relevant persons for their offshore petroleum activities to proceed; however, they are required to demonstrate in their environment plan how the concerns, objections or claims raised by relevant persons were considered and demonstrate that their

Guiding principle	Key concept
	response to that information was appropriate (NOPSEMA, 2023a).
The nature of the person or organisation being consulted, and the function, interest or activity that may be affected, will inform the appropriate manner of consultation with each relevant person (Parliament of Australia, 2023).	What constitutes sufficient information, and a reasonable period of time depends on several factors including the nature of a relevant person's functions, interests and activities (NOPSEMA, 2023a).
What is a reasonable period for consultation will need to be considered on a case-by-case basis (Parliament of Australia, 2023).	The nature, scale, and complexity of an activity, as well as the extent of potential impacts and risks on a relevant person's functions, interests, or activities, may inform what makes a reasonable period for consultation (Parliament of Australia, 2023).
Section 25 places obligations on titleholders but does not place any obligations on relevant persons (Parliament of Australia, 2023).	If a relevant person does not respond to consultation, the titleholder is not required to wait indefinitely for a response (Parliament of Australia, 2023). Titleholders must make reasonable efforts to consult with relevant persons, but the regulations do not require them to get a response to their requests. As long as the titleholder can demonstrate that it has provided sufficient information and a reasonable period for consultation in accordance with subsections 25(2) and (3), the titleholder will have met the consultation requirements.
The consultation process must be practical and reasonable to implement.	There is no requirement in the law for titleholders to pay the costs incurred by relevant persons to be consulted, however they may choose to provide assistance to relevant persons to ensure consultation is carried out efficiently and is robust. This is a matter between the titleholder and relevant persons (NOPSEMA, 2023a). Relevant persons should be aware that while they are free to respond on any matter and raise any concern, this may not be able to be considered if it is outside the scope or purpose of the environment plan and approval process (NOPSEMA, 2023a).
The nature of the person or organisation being consulted, and the function, interest or activity that may be affected, will inform the appropriate manner of consultation with each relevant person (Parliament of Australia, 2023).	What constitutes sufficient information, and a reasonable period of time depends on several factors including the nature of a relevant person's functions, interests and activities (NOPSEMA, 2023a).
What is a reasonable period for consultation will need to be considered on a case-by-case basis (Parliament of Australia, 2023).	The nature, scale, and complexity of an activity, as well as the extent of potential impacts and risks on a relevant person's functions, interests, or activities, may inform what makes a reasonable period for consultation (Parliament of Australia, 2023).
Section 25 places obligations on titleholders but does not place any	If a relevant person does not respond to consultation, the titleholder is not required to wait indefinitely for a response (Parliament of Australia, 2023).

Guiding principle	Key concept
obligations on relevant persons (Parliament of Australia, 2023).	Titleholders must make reasonable efforts to consult with relevant persons, but the regulations do not require them to get a response to their requests. As long as the titleholder can demonstrate that it has provided sufficient information and a reasonable period for consultation in accordance with subsections 25(2) and (3), the titleholder will have met the consultation requirements.
The consultation process must be practical and reasonable to implement.	There is no requirement in the law for titleholders to pay the costs incurred by relevant persons to be consulted, however they may choose to provide assistance to relevant persons to ensure consultation is carried out efficiently and is robust. This is a matter between the titleholder and relevant persons (NOPSEMA, 2023a). Relevant persons should be aware that while they are free to respond on any matter and raise any concern, this may not be able to be considered if it is outside the scope or purpose of the environment plan and approval process (NOPSEMA, 2023a).

Figure 9-1: VOGA's consultation methodology and process



9.3.2 Identifying Relevant Persons

VOGA acknowledges the importance of consultation and undertook a comprehensive assessment to determine who qualified as relevant persons for the purposes of this EP. VOGA recognises that consultation provides an opportunity for relevant persons to be heard and to provide feedback in keeping with best practice principles as outlined in the International Association for Public Participation – *Quality Assurance Standard for Community and Stakeholder Engagement* (IAP2 Australasia, 2023), recognising that for each relevant person consultation may differ.

Table 9-2 details how VOGA identified relevant persons for this EP.

Table 9-2: VOGA's process to identify relevant persons and undertake consultation

Process	Activities and considerations
Identifying potentially relevant person categories	Relevant person category identification methodology: • Consider nature and scale of the activity • Describe the petroleum activity • Spatial extent of the EMBA • Environmental impacts • Spatial mapping datasets and analysis of physical receptors • Undertake actions to identify relevant persons categories • Review of relevant person database • Review of public databases • Research activities.

Identifying relevant persons for consultation	Undertake actions to identify relevant persons:
	• Review of relevant persons databases
	• Review of identified relevant persons in publicly available EPs submitted by other titleholders that may be relevant to this proposed activity
	• Desktop research of publicly available information, studies and key word search
	• Review of information previously provided during engagement and consultation activities
	• Review of fishing catch and effort data and fisheries in the EMBA/Operational Area
	• Review of EMBA overlap (and adjacent) with Native Title registered or determined claims, ILUAs, sacred sites, IPAs and management, to identify First Nations groups
	• Review National Native Title Tribunal website
	• Review public cultural heritage databases relevant to the EMBA
	• Review marine park management plans relevant to the EMBA
	• Review of EMBA overlap with:
	  ○ local government areas
	  ○ petroleum, greenhouse gas and any other NOPTA issued titles

Process	Activities and considerations
	○ area of recreational fishing and areas of interest to charter and tourism operators ○ research institutes, infrastructure operators, historical heritage groups or organisations and local environment or conservation groups with potential activity or presence in the area.
Opportunities for relevant persons to identify themselves if they wish to be consulted through advertising and/or third parties	Undertake actions to identify relevant persons: • Targeted print media advertising campaign to raise awareness of the activity and promote relevant persons to identify themselves and come forward • Geo-targeted social media campaign to raise awareness of the activity, promote self-identification, and direct digital traffic to the consultation website • Distribution of flyers to be displayed at relevant community centres, promoting the activity, self-identification, and listing contact details for VOGA.
Consultation planning and consultation activities	Undertake actions to consult with relevant persons: • Print media advertisement campaigns to seek feedback from relevant persons and detail avenues for providing feedback • Development of consultation materials (information sheets, presentations etc.) • Draft consultation outreach materials (emails, letters) • Development of a consultation webpage on VOGA's website to host relevant information on the activity, provide contact details, and resources such as a frequently asked questions document • Geo-targeted social media campaign to raise awareness of the activity, promote self-identification, and direct digital traffic to further information hosted on the consultation website.
Consulting relevant persons	Undertake consultation outreach with relevant persons: • Consultation outreach with relevant persons to notify them and receive feedback • Follow ups with relevant persons • Two-way correspondence with relevant persons • Face-to-face meetings (in person and virtually).

9.3.3 Public Awareness Campaign and Self-identification Opportunities

VOGA has undertaken several promotional activities for organisations and individuals to self-identify as potentially relevant persons if they believe their functions, interests, or activities may be affected by the activity. These included print media, community flyers, and social media advertisements with links to a webpage containing information about the proposed activities.

Further details of the public awareness campaign and self-identification opportunities including efforts to ensure self-identification opportunities for First Nations organisations and individuals are described in Appendix F (Section 1.3). A schedule of advertising for both social media and print media is included in Appendix F (Section 1.3.2).

An information flyer was displayed at community centres within and adjacent to the EMBA, outlining the activity and promoting self-identification for consultation purposes. VOGA's consultation webpage provided fact sheets and other publicly available materials. Further details concerning the community flyer and webpage are included in Appendix F (Section 1.3.3; Figure 1-16 and Figure 1-18).

These activities and information provided a more than reasonable opportunity to raise public awareness of consultation and for organisations and individuals to self-identify for the purpose of OPGGS(E)R 25 consultation.

VOGA's process provides a reasonable timeframe for the self-identification of relevant persons, for relevant persons to consider and access consultation information, and for relevant persons to provide feedback for VOGA to consider.

9.3.4 Identification and Consultation with First Nations People and Organisations

VOGA's consultation with First Nations groups was reinforced and in keeping with the *Ask First – A guide to respecting Indigenous Heritage places and values* (Australian Heritage Commission, 2002). VOGA recognises the necessity to maintain heritage values and place, that are a vital part of First Nations groups 'sense of place', cultural identity and well-being. Indigenous heritage is unique and part of Australia's national cultural heritage, requiring recognition and protection for future generations of all Australians.

The *Sea Countries of the North-West – literature review on Indigenous connection to and uses of the North-West Marine Region* (DCCEEW, 2007) was considered when consulting First Nations groups in Commonwealth waters. This literature outlines the strong connection and direct interest First Nations groups have in planning and managing the NRMR.

DCCEEW is responsible for administering the *Underwater Cultural Heritage Act 2018*, which provides protection from disturbance or adverse impact to archaeological remains located in Australia's near and offshore environment. The department provides guidelines with direction for proponents who undertake activities in Australian waters (DCCEEW, 2023d).

When approaching identification and consultation with relevant First Nations groups, VOGA undertook a broad and tailored approach.

1. Initial Identification

- Developed a list of all Native Title registered claims and determinations along the coastline of WA.
- Reviewed the EMBA and overlap or adjacency to Native Title registered claims and determinations to establish a list of potentially affected First Nations groups.
- Identified First Nations groups as potentially relevant persons, comprising:
  - Native Title Representative Bodies (NTRBs)
  - Registered Native Title Bodies Corporate (RNTBCs – the formal name given to a group once Native Title has been determined)
  - Prescribed Bodies Corporate (PBCs – the legal entity formed by a group of Native Title Claimants during the determination process, but used interchangeably with RNTBCs)

- Aboriginal Corporations – Aboriginal run or managed businesses, often operating on behalf of, or under a RNTBC
- Land and Sea Management Groups – primarily Ranger Groups, many of whom operate under a RNTBC.

2. Tiered Contact Methodology

Utilising extensive spill modelling, VOGA has conservatively assessed that planned impacts to First Nations relevant persons functions, interests, and activities (including cultural values or features) are unlikely to extend beyond 200 km from the Operational Area for this EP.

This was considered a reasonable basis for including a tiered methodology to focus consultation efforts on those relevant persons closest to the planned activities outlined in this EP and those who could provide inputs into cultural features closest to the planned activities.

However, regardless of which tier a group was categorised in, VOGA's overarching approach remained consistent in principle.

Table 9-3 below identifies the First Nations people, groups and organisations categorised into Tier 1 and Tier 2. For the Tier 3 category, Table 9-4 below identifies the First Nations people and organisations determined to be not relevant, but the members are at the periphery of the EMBA or are First Nation people or organisations that can self-identify.

Table 9-3: Approach to consultation with relevant First Nations people and organisations

Tier	Overview of identified First Nations people and organisations	Relevant Persons	Consultation efforts
Tier 1	Closest to planned activities - located within 200 km of the operational area on the Australian mainland: • Determined Native Title Holders (including relevant Registered Native Title Body Corporate (RNTBC) or Prescribed Body Corporate (PBC)). • Aboriginal corporation providing environmental management functions.	**Representative Aboriginal Corporations** PBCs: • Ngarluma People – Ngarluma Aboriginal Corporation RNTBC • Kariyarra People – Kariyarra Aboriginal Corporation RNTBC • Ngarluma / Yindjibarndi – Yindjibarndi Aboriginal Corporation • Yaburara & Mardudhunera People - Wirrawandi Aboriginal Corporation RNTBC • Ngarla and Ngarla #2 (Determination Area A) – Wanparta Aboriginal Corporation RNTBC. Other: • Murujuga Aboriginal Corporation (MAC) (*see note in 'consultation efforts').	Precedence was placed on consultation with Tier 1 groups through focussed efforts, including attempts to contact them via multiple forms of communication —such as phone calls, text messages, and emails—where such details were available. Where long-standing relationships were not already in place or being actively maintained by the relevant group, efforts were made to initiate and foster enduring connections, consistent with principles of respectful engagement. These efforts were undertaken not only to disseminate information about the EP and the Wandoo Facility, but also to foster meaningful, two-way engagement with appropriate representatives—such as the Board or Chief Executive Officer—in accordance with Regulation 25 OPGGS(E)R and NOPSEMA's *Community Engagement and Consultation Guidance Note (GN1746)*. This engagement sought to gather input on cultural features, values, and potential impacts, and to determine whether additional community meetings were required to satisfy our consultation obligations, beyond the provision of information through advertising. As Tier 1 relevant persons, VOGA may adopt a broader approach to consultation with these stakeholders, during which information about the Wandoo Facility—as well as other Environmental Plans—may be discussed to provide appropriate context and support deeper understanding. This approach reflects VOGA's commitment to transparent

Tier	Overview of identified First Nations people and organisations	Relevant Persons	Consultation efforts
			communication, mutual respect, and early identification of concerns that may influence the ongoing development or revision of the EP. This approach was also the preference of these stakeholders. **Note:** Murujuga Aboriginal Corporation (MAC) was not initially contacted as a Tier 1 Relevant Person because, at the commencement of our engagement process, the primary focus was on PBCs, as these are the recognised "relevant persons" under the *Native Title Act 1995 (Cth)* for representing First Nations Peoples. At that time, MAC was identified as a Tier 3 significant stakeholder but not a formal "Relevant Person," as it was not known whether MAC held authority to engage on behalf of First Nations Peoples—given that it is not a PBC—and whether it could consult with consideration to the *NOPSEMA Consultation on Offshore Petroleum Environment Plans – Information for the Community* brochure (published May 2023). During engagement with other First Nations groups, MAC's classification was elevated to Tier 1, in recognition of its significant role and influence in the region. As with the other Tier 1 relevant persons, these efforts were undertaken not only to disseminate information about the EP and the Wandoo Facility, but also to initiate engagement with appropriate representatives—such as the Board or Chief Executive Officer—to determine whether additional community meetings are required to meet our consultation obligations.

Tier	Overview of identified First Nations people and organisations	Relevant Persons	Consultation efforts
Tier 2	• Determined Native Title Holders (including relevant representative bodies) (excluding Tier 1 and Tier 3). • Aboriginal corporations providing environmental management functions, who are coastally adjacent to the planning area (excluding Tier 1 and Tier 3).	**Representative Aboriginal Corporations** PBCs: • Rubibi Community – Yawuru Native Title Holders Aboriginal Corporation RNTBC • Karajarri People – Karajarri Traditional Lands Association (Aboriginal Corporation) RNTBC • Nyangumarta People (Part A) – Nyangumarta Warraran Aboriginal Corporation RNTBC • Nyangumarta-Karajarri Overlap Proceeding (Yawinya) – Nyangumarta Karajarri Aboriginal Corporation RNTBC • Thalanyji People– Buurabalayji Thalanyji Aboriginal Corporation RNTBC • Gnulli, Gnulli #2 and Gnulli #3 – Yinggarda, Baiyungu and Thalanyji People – Nganhurra Thanardi Garrbu Aboriginal, Yinggarda Aboriginal Corporation • Malgana Part A – Malgana Aboriginal Corporation RNTBC • Nanda People Part B, Malgana 2 and Malgana 3 – Malgana Aboriginal Corporation RNTBC & Nanda Aboriginal Corporation RNTBC • Nanda People and Nanda #2 - Nanda Aboriginal Corporation RNTBC Native Title Representative Bodies: • Kimberly Land Council (KLC) – (NTRB) Yamatji Marlpa Aboriginal Corporation (YMAC) – (NTRB)	Tier 2 relevant persons were identified as stakeholders whose functions, activities or interests may be affected by the proposed activities, but to a lesser extent than Tier 1 stakeholders. While VOGA's systematic approach prioritised initial contact with Tier 1 persons, engagement with Tier 2 stakeholders commenced at the same time where possible. A concerted effort was made to contact Tier 2 stakeholders through multiple available communication methods, including phone calls, text messages, and emails. The aim was to gather input on cultural values, features, and any other matters relevant to the preparation of the EP. Where possible, VOGA sought to establish genuine two-way dialogue with appropriate representatives, such as Boards or Chief Executive Officers, and responded to any requests to enter into consultation agreements regarding the EP.

Table 9-4: Approach to consultation with First Nations people and organisations identified as not relevant

Tier	Overview of identified First Nations people and organisations	Identified and assessed as not relevant	Consultation efforts
Tier 3	• Determined Native Title Holders (including relevant representative bodies) whose members are at the periphery of the Planning Area (excluding Tier 1 and Tier 2). • Aboriginal Corporations – Aboriginal run or managed businesses, often operating on behalf of, or under a RNTBC. • Land and Sea Management Groups – primarily Ranger Groups, many of whom operate under a RNTBC.	**Representative Aboriginal Corporations** PBCs: • Mayala People– Mayala Inninalang Aboriginal Corporation • Bardi and Jawi – Bardi Jawi Niimindiman Aborigincal Corporation RNTBC • Warrwa Mawadjala Gadjidgar & Warrwa Combined Part A – Madanann Nada Aboriginal Corporation RNTBC • Bindunbur Nimanburr Aboriginal Corporation, Nyul Nyul PBC Aboriginal Corporation & Gogolanyngor Aboriginal Corporation • Jabirr Jabirr/Ngumbarl – Gogolanyngor Aboriginal Corporation • Yamatji Nation – Bundi Yamatji Aboriginal Corporation.	Tier 3 stakeholders were identified during the stakeholder mapping process but were assessed as not meeting the definition of relevant persons under Regulation 25 of the OPGGS(E)R. As such, they were not directly contacted. However, to ensure transparency and provide a reasonable opportunity for self-identification, a public awareness campaign was implemented. This included clear pathways for interested parties to contact VOGA should they wish to participate in the consultation process. No contact was received from these groups during the consultation period. However, in the event that a Tier 3 stakeholder makes contact or expresses an interest in the EP, VOGA will respond promptly using the communication method provided (e.g. phone call, text message, or email). Where appropriate, and if an email address is supplied, an EP Information Sheet will be made available to support informed engagement. Tier 3 stakeholders were identified during the stakeholder mapping and were identified but assessed as not relevant and not directly contacted. A public awareness campaign and self-identification opportunities allowed for stakeholders to contact VOGA if interested in participating in consultation.

3. Cultural Awareness and Understanding Lore and Protocols

VOGA ensured that all staff involved in the consultation process had undertaken cultural awareness training to understand the significance of Indigenous heritage and protocols.

VOGA understands that First Nations people follow lore and customs with respect to land. Cultural protocol establishes who can and cannot 'speak for country' (South West Aboriginal Land and Sea Council, 2025).

Following research and consultation activities, it was understood that not all groups considered themselves responsible for cultural and spiritual care of land and sea to equal or similar degrees. For example:

- NTRBs, including Kimberley Land Council and Yamatji Marlpa Aboriginal Corporation, often provide administration services such as payroll, legal and human resource services to RNTBCs or PBCs who have chosen to use the NTRB as an umbrella organisation under which to function, in addition to their primary role of assisting with matters pertaining to Native Title claims and determinations.
- VOGA engaged with NTRBs to receive advice on groups who could be relevant for consultation and to gather insights about preferred consultation approaches.
- However, the NTRBs do not consider it appropriate to represent the views of the RNTBCs or other groups who use their services, although in some circumstances they operate as a conduit or formal contact point for RNTBCs.

4. Culturally Appropriate Engagement

When engaging with First Nations relevant persons, VOGA aimed to adopt a culturally appropriate and tailored approach.

- VOGA was aware that Traditional Lore time, typically from November to February, is when Indigenous communities engage in cultural activities and ceremonies. These periods are not fixed to specific dates but are instead aligned with natural cycles, seasons, and significant cultural events.
- During Lore time, it is customary for First Nations groups to focus on cultural activities, ceremonies, and the passing down of traditions. As such, it would not be possible for meetings and other formal engagements to be scheduled during these times.
- For this EP, VOGA started an initial outreach in October 2024, understanding that stakeholders may engage not until after the Lore time period. VOGA recognised that early engagement was important to build trust and allow time for meaningful consultation.
- VOGA was prepared to be flexible and while it followed up to arrange engagements, was aware that it may take time for stakeholders to be available and comfortable with meetings (Working with Indigenous Australians, 2020).
- During the period of October 2024 to March 2025, VOGA made multiple attempts to engage with First Nations groups to progress consultation on this EP. Many attempts were made to contact First Nations groups once Lore time was complete and before submission of the EP.

- VOGA continued to engage with First Nations groups on this EP as part of ongoing consultation.
- In June 2025, VOGA sent written communication to First Nations groups advising of its intent to submit this EP and explained that consultation on this EP can continue as part of ongoing consultation. VOGA advised that any feedback would be assessed and if required the EP could be updated through the management of change process.
- Further contact before submission resulted in a number of meetings being arranged in July 2025.

At the initial outreach to First Nations groups, VOGA:

- Stated the importance of cultural heritage to the Native Title Holders and committed to ensuring that these values are respected and integrated into project planning.
- Sought advice on preferred contact and engagement methods.
- Recognised the potential need for formal agreements before consultation.
- Wanted to make sure the engagement was tailored to the group's needs and offered a co-design approach, where the agenda for any meeting is mutually agreed and includes input from the group.
- Outlined the purpose of the consultation was to give the group an opportunity to provide input to:
  - VOGA's understanding of the current environment and its cultural characteristics
  - how VOGA's activities might affect the existing environment, including cultural aspects
  - potential measures and controls to reduce the environmental impact of the proposed activities on the group's functions, interests, and activities.

Initial outreach emails can be found in Appendix F.

5. Decision Making Process

VOGA understands that chairpersons, workers and other representatives from the First Nations group or community often do not make immediate decisions. Information from an email/phone call, meeting or consultation may need to be taken to other members of the community to discuss and decide, which can take time. As part of ongoing consultation, VOGA will continue to engage with First Nations groups on this EP.

6. Capacity to Engage

VOGA may need to provide tailored and additional resources to First Nations groups to help them engage effectively in the consultation process. This could include funding for attendance at meetings or for independent advisors. For this EP, VOGA has provided both tailored and additional resources to facilitate and fund consultation meetings with First Nations groups.

7. Tailored Communication Methods

VOGA develops tailored communication materials for consultation outreach including a summary information sheet which is shorter with plain English language, more diagrams and images and less technical information (Appendix F, Section 1.3.5, Figure 1-19).

VOGA aims to use communication methods that are preferred by First Nations groups. This includes making phone calls, text messages and prioritising face-to-face meetings where possible, or meeting by Microsoft Teams as appropriate. VOGA accommodates preference to be engaged on-Country (or other locations).

When face-to-face or virtual meetings are held with RNTBC's and Aboriginal Corporations, VOGA:

- Researches the group and publicly available consultation material (from consultation with other titleholders) to understand what areas might be of interest to the group.
- Brings printed out consultation material to meetings: enlarged maps with the group's Native Title determination or ILUA, consultation and summary information sheets, and copies of the presentation to the meeting to ensure information is readily accessible.
- Tailors its presentation material and verbal delivery of information to what VOGA considers to be the primary ways the group's functions, interests or activities could be affected. VOGA includes specific information that is more detailed on potential areas of interest. VOGA also tailors the acknowledgement of country and includes a local photo on the slide.
- Aims to conduct its consultation meetings with co-design feedback. During consultation, VOGA has received positive feedback from a NTRB about the level of information and imagery used in the presentation. Based on feedback received from the NTRB, VOGA sought to include more video content at its next meeting of the marine environment at and surrounding Wandoo from its marine monitoring surveys.

Information about the specific consultation activities with First Nations relevant persons can be found at Appendix F (Section 1.3.4).

9.3.5 Relevant Persons Consultation Process

Consultation allows for the free and open exchange of information between a titleholder and any relevant persons who may be impacted by a proposed activity:

- The process provides a genuine opportunity for relevant persons to be heard and provide feedback.
- The process includes mechanisms for titleholders to receive information from relevant persons that they might not have otherwise received.
- The process enables a titleholder to gain better understanding about the environment that may be affected and measures that may be necessary to mitigate the potential

environmental impacts and risks associated with either a petroleum or greenhouse gas activity[5].

- Consultation does not carry with it any obligation on the titleholder either to seek or reach agreement; nor requires consent on the activity subject to the consultation; however, the titleholder should be receptive to suggestions from a relevant person, where these may improve the overall environmental outcome[6] (NOPSEMA, 2023a).

The consultation process must be practical and reasonable to implement:

- Consulting with relevant persons and potential relevant persons is a real-world obligation that must be interpreted in a practical and pragmatic way that makes a process both reasonable and workable[7].
- Where communal interests are held, the process of consultation needs to reasonably reflect the characteristics of the communal interests affected and does not necessarily require communications with each and every person who is a member of the relevant community[8].
- The obligation to identify relevant persons for the purpose of consultation must be reasonably capable of discharged (i.e. relevant persons need to be ascertainable) within a reasonable time[9].

Consultation entails providing adequate information about a proposed activity to relevant individuals and allowing them a reasonable period to review and consider the information:

- Information provided to a relevant person should be sufficient to allow them to make an informed assessment of consequence of the proposed activity on their functions, interests or activities.
- The nature, scale, and complexity of a proposed activity, as well as the extent of potential impacts and risks on a relevant person's functions, interests, or activities, is considered when determining a reasonable period for consultation.

Participation in the consultation process by relevant individuals is voluntary:

- Relevant persons are not obligated to respond to a titleholder's request to participate in the consultation process (Parliament of Australia, 2023; NOPSEMA, 2023a).
- A titleholder is not required to wait indefinitely for a response where sufficient information and reasonable period of time has been afforded to the relevant person (Parliament of Australia, 2023).

Figure 9-2 demonstrates VOGA's ongoing consultation process.

[5] *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Appeal Decision), paragraphs [49], [54], [57], [89] and [141].

[6] *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Appeal Decision), paragraphs at [89], [109], [136], [138] and [141].

[7] *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Appeal Decision), paragraphs [48], [89], [104], [108], [109], [141] and [153].

[8] *Santos NA Barossa Pty Ltd v Tipakalippa* [2022] FCAFC 193 (Appeal Decision), paragraphs [136], [141] and [153].

[9] As relevant to the categories of persons defined in the 25(1) (OPGGS(E) Regulations.

Table 9-5 provides a summary of the relevant persons or organisations by category identified by VOGA, the actions taken to identify and consult with them, the consultation process and information provided, and VOGA's determination of what constitutes a reasonable period and sufficient information. This process conducted consistent with Regulation 25(1)(a)(b)(c) of the OPGGS(E)R.

Table 9-5: Relevant persons identified by VOGA – actions taken – consultation process and information provided

Identified relevant persons	Actions taken to identify relevant persons	Consultation process and information provided	Reasonable period and sufficient information
Regulation 25(1)(a) of the OPGGS(E)R: Departments or agencies of the Commonwealth to which the activities to be carried out under the EP may be relevant			
Commonwealth Government Departments and Agencies	• Undertook an audit of Commonwealth government websites and directories to ascertain roles and responsibilities.	• VOGA emailed the Commonwealth government agency/authority and included an activity summary, directions for how to provide input into the EP development through consultation, the consultation timing and a link to VOGA's website with additional resources on EP consultation. • Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we deem to be sufficient information for each stakeholder. • Additional targeted content via email, where applicable.
Regulation 25(1)(a) and (b) of the OPGGS(E)R: Departments or agencies of WA to which the activities to be carried out under the EP may be relevant			
State Government Departments and Agencies	• Undertook an audit of state government websites and directories to ascertain roles and responsibilities.	• VOGA emailed the State government agency/authority and included an activity summary, directions for how to provide input into the EP development through consultation, the consultation timing and a link to VOGA's website with additional resources on EP consultation. • Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we deem to be sufficient information for each stakeholder. • Additional targeted content via email, where applicable.

Identified relevant persons	Actions taken to identify relevant persons	Consultation process and information provided	Reasonable period and sufficient information
Regulation 25(1)(d) of the OPGGS(E)R: Persons or organisations whose functions, interests or activities may be affected by the activities to be carried out under the EP			
Commonwealth commercial fishing – representative bodies; and Commonwealth commercial fisheries	• Assessed Commonwealth commercial fishing catch and effort data in the Operational Area. • Assessed fisheries entitled to fish in the EMBA and searched applicable websites.	• VOGA emailed to introduce its operations and upcoming activities. • Sought representative bodies' input on preferred method of consultation. • VOGA emailed and provided consultation information which included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources. • Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures. • VOGA provided a commercial fisher information sheet, which included an overview of the proposed activities; key information for the commercial fishing sector about the activities; coordinates for operational areas; an activity summary; assessment of commercial fishing, potential effects and impacts; and VOGA's impact assessment.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures. • A commercial fisher information sheet, which included an overview of the proposed activities; key information for the commercial fishing sector about the activities; coordinates for operational areas; an activity summary; assessment of commercial fishing, potential effects and impacts; and VOGA's impact assessment which we deem to be sufficient information for each stakeholder. • Additional targeted content via email, where applicable.

Identified relevant persons	Actions taken to identify relevant persons	Consultation process and information provided	Reasonable period and sufficient information
State commercial fishing – representative bodies	• Assessed the Western Australian Government commercial fishing catch and effort data in the Operational Area and EMBA.	• VOGA emailed WAFIC and provided consultation information. • The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources. • Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures • VOGA provided a commercial fisher information sheet, which included an overview of the proposed activities; key information for the commercial fishing sector about the activities; coordinates for operational areas; an activity summary; assessment of commercial fishing, potential effects and impacts; and VOGA's impact assessment.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information Sheet including an overview of the proposed activities; potential impacts, risks and management measures. • A commercial fisher information sheet, which included an overview of the proposed activities; key information for the commercial fishing sector about the activities; coordinates for operational areas; an activity summary; assessment of commercial fishing, potential effects and impacts; and VOGA's impact assessment which we deem to be sufficient information for each stakeholder. • Additional targeted content via email, where applicable.
State commercial fisheries	• Assessed the Western Australian Government commercial fishing catch and effort data in the Operational Area and EMBA. • Assessed the fisheries entitled to fish in the operational area and EMBA and searched applicable websites.	• VOGA emailed WAFIC and provided consultation information to distribute to licence holders. • The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures • A commercial fisher information sheet, which included an overview of the proposed activities;

Identified relevant persons	Actions taken to identify relevant persons	Consultation process and information provided	Reasonable period and sufficient information
	• Entered a fee for service arrangement with the West Australian Fishing Industry Council (WAFIC) to liaise directly with State commercial fisheries. Followed WAFIC's guidance for its preferred approach to consultation with state commercial fisheries (WAFIC, 2023).	• Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures. • VOGA provided a commercial fisher information sheet, which included an overview of the proposed activities; key information for the commercial fishing sector about the activities; coordinates for operational areas; an activity summary; assessment of commercial fishing, potential effects and impacts; and VOGA's impact assessment. • WAFIC undertook consultation with licence holders on behalf of VOGA and advised of any feedback at the end of the consultation process.	key information for the commercial fishing sector about the activities; coordinates for operational areas; an activity summary; assessment of commercial fishing, potential effects and impacts; and VOGA's impact assessment. which we deem to be sufficient information for each stakeholder. • Additional targeted content via email, where applicable.
Recreational fishers and marine users and peak representative bodies	• Assessed potential Operational Area and EMBA overlap with the interest of recreational fishers, marine users, tourism operators and peak representative bodies and searched applicable websites.	• VOGA emailed and sent postal letters providing consultation information. • Emails and letters included an activity summary, directions for how to provide input into the EP development through consultation, the consultation date and a link to VOGA's website with additional resources on EP consultation • Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we deem to be sufficient information for each stakeholder.

Identified relevant persons	Actions taken to identify relevant persons	Consultation process and information provided	Reasonable period and sufficient information
Energy industry titleholders and operators	• Assessed the potential presence in the EMBA and searched applicable websites.	• VOGA emailed and provided consultation information. • The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation date and a link to VOGA's website with additional resources on EP consultation. • Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we deem to be sufficient information for each stakeholder.
Peak industry titleholders and operators	• Assessed the potential presence in the EMBA and searched applicable websites.	• VOGA emailed and included an activity summary, directions for how to provide input into the EP development through consultation, the consultation date and a link to VOGA's website with additional resources on EP consultation. • Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we deem to be sufficient information for each stakeholder.
Infrastructure operators	• Assessed the potential presence in the Operational Area and EMBA and searched applicable websites.	• VOGA emailed and included an activity summary, directions for how to provide input into the EP development through consultation, the consultation date and a link to VOGA's website with additional resources on EP consultation.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we

Identified relevant persons	Actions taken to identify relevant persons	Consultation process and information provided	Reasonable period and sufficient information
		• Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures.	deem to be sufficient information for each stakeholder.

Traditional Custodians and First Nations nominated representative corporations and NTRBs	• Developed a list of all Native Title registered claims and determinations along the coastline of WA.
	• Reviewed the EMBA and overlap or adjacency to Native Title registered claims and determinations to establish a list of potentially affected First Nations groups.
	• Identified First Nations groups as potentially relevant persons, comprising:
	  ○ NTRBs
	  ○ RNTBCs – the formal name given to a group once Native Title has been determined
	  ○ PBCs – the legal entity formed by a group of Native Title Claimants during the determination process, but used interchangeably with RNTBC
	  ○ Aboriginal Corporations – Aboriginal run or managed businesses, often operating on behalf of, or under a RNTBC
	  ○ Land and Sea Management Groups – primarily Ranger Groups, many of whom operate under a RNTBC.
		• VOGA emailed and telephone called to introduce its operations and seek engagement in a co-design consultation process
		• VOGA emailed and included an activity summary, directions for how to provide input into the EP development through consultation, the consultation date and a link to VOGA's website with additional resources on EP consultation.
		• Summary consultation information sheet and links to a detailed consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures.
		• Virtual or in person meetings with supporting presentation materials and handouts.
		• Continued emails and telephone calls to groups.
			• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback.
			• A summary consultation information sheet and links to a detailed consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures
			• Bespoke maps outlining the EMBA relevant to areas of interest, such as native title boundary.
			• Virtual or in person meetings with supporting presentation materials and handouts which we deem to be sufficient information for each stakeholder.
			• Additional targeted content and requests via email.

Identified relevant persons	Actions taken to identify relevant persons	Consultation process and information provided	Reasonable period and sufficient information
Historical heritage groups or organisations	• Searched public cultural heritage databases relevant to the Operational Area and EMBA.	• VOGA emailed and included an activity summary, directions for how to provide input into the EP development through consultation, the consultation date and a link to VOGA's website with additional resources on EP consultation. • Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we deem to be sufficient information for each stakeholder. • Additional targeted content via email, where applicable.
Local government and recognised local business and community reference/liaison groups or organisations	• Assessed the boundaries of local governments, local business and community reference/liaison groups organisations on EMBA and potential presence in the EMBA and searched applicable websites.	• VOGA emailed and included an activity summary, directions for how to provide input into the EP development through consultation, the consultation date and a link to VOGA's website with additional resources on EP consultation. • Consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we deem to be sufficient information for each stakeholder.
Research institutes	• Searched research institutes websites and publicly available information.	• VOGA emailed and included an activity summary, directions for how to provide input into the EP development through consultation, the consultation date and a link to VOGA's website with additional resources on EP consultation. • Consultation information sheet including an overview of the proposed activities;	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we deem to be sufficient information for each stakeholder.

Identified relevant persons	Actions taken to identify relevant persons	Consultation process and information provided	Reasonable period and sufficient information
		potential impacts, risks and management measures.	
Local environment and conservation groups or organisations	• Searched environment and conservation groups websites and publicly available information • Reviewed publicly available EP documents from other titleholders on the NOPSEMA website.	• VOGA emailed and included an activity summary, directions for how to provide input into the EP development through consultation, the consultation date and a link to VOGA's website with additional resources on EP consultation.	• A reasonable period of 30 business days (four weeks), subject to the nature and scale of the proposed activity, was provided for feedback. • A consultation information sheet including an overview of the proposed activities; potential impacts, risks and management measures which we deem to be sufficient information for each stakeholder.
Individual – self-identified	• Undertook extensive advertising and promotional activities to enable self-identified relevant persons.	• VOGA received a number of voice messages from a self-identified relevant person. • VOGA followed up with several calls and a text message.	• The consultation period during the development of an EP is generally defined by VOGA as being 30 business days (four weeks), subject to the nature and scale of the proposed activity. Where dialogue with a self-identified relevant persons is ongoing after this period, VOGA will continue to consult with these persons until VOGA believes that it has provided sufficient evidence/ justification to close the consultation.

9.3.6 Provision of Sufficient Information

VOGA provided sufficient information to all relevant person categories for the purpose of consultation to allow them to make an informed assessment of the possible consequences of the activity on their functions, interests or activities.

VOGA produced a Consultation Information sheet for this EP and distributed to relevant persons and organisations. The Consultation Information sheet included an overview of the proposed activities; maps of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the EMBA based on a review of publicly available information. It is also available on VOGA's website.

As part of the consultation process emails were sent to relevant persons which included an activity summary, directions for how to provide input into the EP development through consultation, advice regarding the consultation closing date and a link to VOGA's website with additional resources on EP consultation.

Information provided by VOGA to relevant persons was provided through a number of channels:

- EP Consultation Information Sheet
- EP Summary Consultation Information Sheet
- EP Commercial Fisher Information Sheet
- Emails
- Letters
- Telephone calls
- Virtual or in person meetings with supporting presentation materials and handouts
- Published notices in applicable traditional print media
- Undertook geotargeted advertising on social media platforms
- Distribution of community flyers in regional community centres.

9.3.7 Approach to Consulting Relevant Persons

VOGA adopted a bespoke approach for all relevant person categories, and each group/person was individually considered to ensure they received sufficient material that was appropriate for the recipient and aligned with any guidance or specific requirements.

This included a planned and considered approach to engaging identified relevant persons and interested parties on VOGA's proposed activities. The company undertook a broad consultation process to raise public awareness, encourage feedback, and prompt respectful two-way consultation.

9.3.8 Providing a Reasonable Period for Consultation

In accordance with prescribed regulations regarding a 'reasonable period', VOGA initiated consultation with certain categories of relevant persons in October and November 2024, providing additional time before commencing consultation on the EP for gathering input on preferred methods. VOGA commenced its broad consultation approach on 2 December 2024. To account for the December and January public holidays and ensure relevant persons had adequate time to provide feedback, the consultation period closed on the 17 January 2025. VOGA remains committed to ongoing engagement beyond this deadline to facilitate meaningful dialogue and address any further considerations or feedback on this EP.

9.3.9 Consultation Opportunities/Channels

VOGA provided consultation opportunities through multiple mediums such as:

- Introductory telephone calls
- Response via email or mail
- Provision of a consultation phone number
- In-person or virtual meetings as appropriate and mutually agreed.

In the instances where no response was received following initial consultation outreach, attempts were made to follow up identified relevant persons via email, letter, telephone calls and text message as appropriate.

9.3.10 Unplanned Event

VOGA has established procedures should an unplanned event occur.

Within our Exploration and Survey OPEP [AUPD24001-VOG-1100-YH-0016], VOGA has procedures to ensure relevant persons are notified within 24 hours should a Level 2 oil spill occur. VOGA provides notifications to relevant persons as requested through its consultation process.

VOGA routinely reviews its EPs to ensure all existing environment information is up to date. A current list of commercial fisheries and aquaculture, government departments and First Nations groups that could potentially be impacted is included in this update.

VOGA has prepared an Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016] utilising the joint industry framework for operational and scientific monitoring. VOGA is also a member of the OSRL joint industry arrangements for oil spill management which provides capacity to implement the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].

9.4 Ongoing Consultation

VOGA recognises there will be relevant persons unable to provide feedback within the timeframes set out in Regulation 25 of the OPGGS(E)R and the extended consultation period provided by VOGA for the preparation of this EP.

If consultation cannot take place before the EP submission, VOGA will notify the relevant person of the intent to submit the EP and advise that consultation can continue in ongoing consultation, where feedback can be received, assessed and responded to (as appropriate) throughout the life of an EP. Figure 9-2 demonstrates VOGA's ongoing consultation process.

In this way, if a response is received, consultation can commence after the EP is submitted and feedback can be assessed and incorporated through the MoC process (Section 8.5). In accordance with Regulation 22(15), ongoing consultation is part of VOGA's implementation strategy. Should consultation feedback be received following acceptance of this EP in which a measure or control which VOGA considers requires implementation or updates to meet the intended outcome of consultation, VOGA will apply its MoC process (Section 8.5).

Throughout the consultation process, a number of notification requests were made. These have been identified in Appendix F and listed in Table 9-6.

9.4.1 Ongoing Consultation with First Nation Groups

VOGA remains in ongoing consultation with First Nation groups. At the time of EP submission, there are no outstanding issues to resolve as a result of relevant person consultation.

VOGA will continue to seek the opportunity to continue to meet with First Nations groups already consulted, and Tier 1 First Nations groups it is yet to meet with (Appendix F). VOGA is developing an Ongoing Engagement Plan with First Nations Groups ("Ongoing Engagement Plan"), to demonstrate VOGA's commitment to ongoing engagement of First Nations. It is a living document, designed to evolve with ongoing consultation and feedback from First Nations for all its activities.

The Ongoing Engagement Plan has been developed so that First Nations can, on an ongoing basis, provide VOGA with feedback relating to the possible consequences of an activity to be carried out under an EP on their functions, interests and activities as they relate to cultural values. This feedback will be evaluated in conjunction with First Nation groups and, where necessary, avoidance or mitigation strategies will be developed.

VOGA is committed to continue to receive feedback on cultural values for the life of an EP, the inclusion of new information and the development of avoidance or mitigation strategies in collaboration with First Nations. This information will be recorded and assessed and any potential impacts to the accepted EP evaluated via the MoC process (Section 8.5).

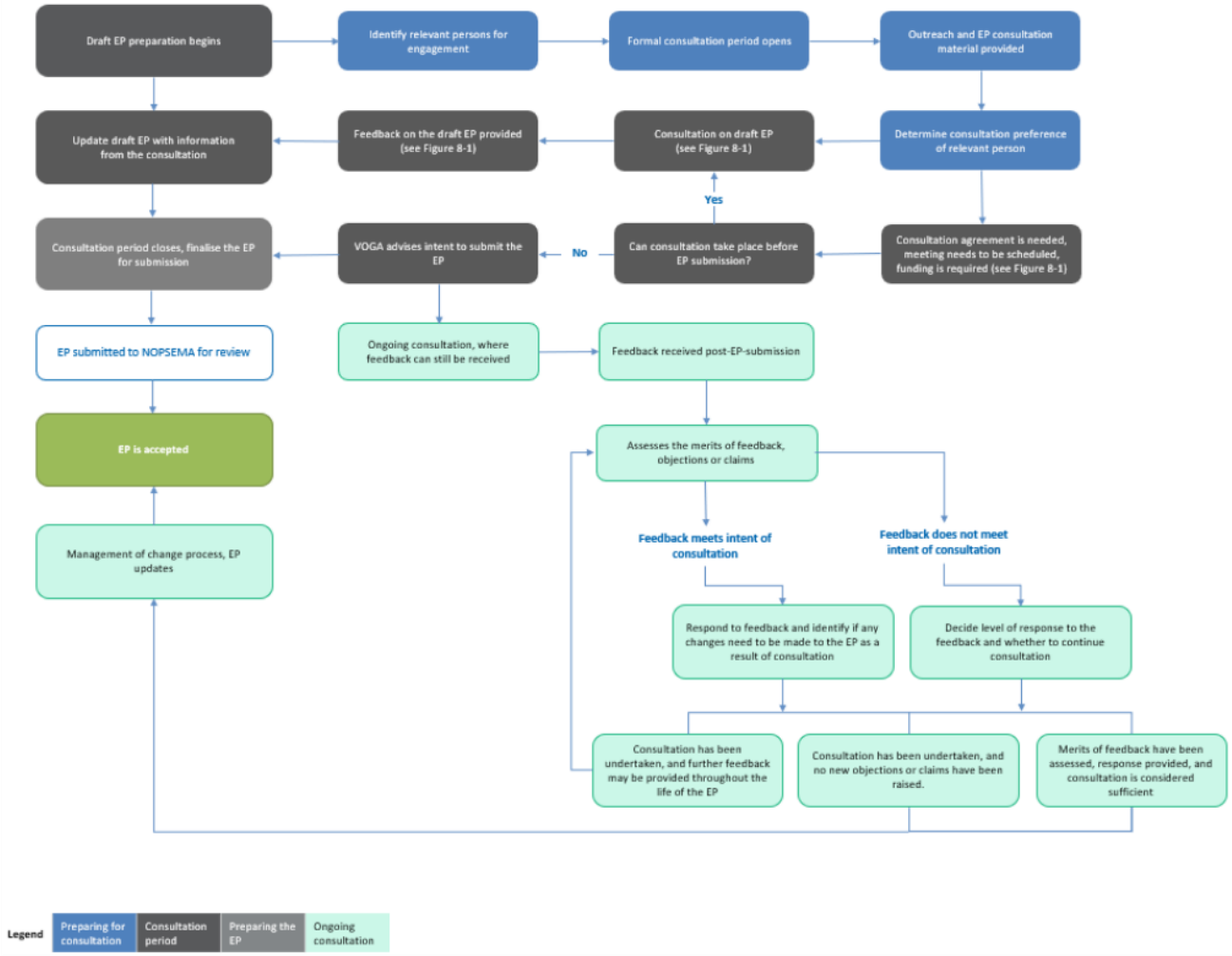
Table 9-6: Ongoing consultation engagements

Report	Recipient	Purpose	Frequency	Content
Emails/Meetings	Relevant First Nation Groups	Identification, assessment and consideration of cultural values relevant to the Operational Area and EMBA	Ongoing	Assessment of any relevant new information on cultural values will be assessed. VOGA will apply its MoC process, where appropriate (Section 8.5).
Notification (email)	AHO	As requested by AHO during consultation.	No less than 4 weeks prior to commencement.	Date of activity start. Addressed in (Table 7-2, CM-1.2) .
Updates (email)			As required.	Changes to planned activities.
Notification (email)	AMSA – Marine Safety	As requested by AMSA during consultation.	No less than 4 weeks prior to commencement and at the end of activities.	Date of activity start. Addressed in (Table 7-2, CM-1.2).
			Contact AMSA's Rescue Centre (ARC) and Joint Rescue Coordination Centre (JRCC) at least 24–48 hours before operations commence.	
Notification (Australasian Underwater Cultural Heritage Database tool)	DCCEEW – Underwater Cultural Heritage	As requested by DCCEEW – Underwater Cultural Heritage during consultation.	Within 21 days of a discovery.	VOGA will notify the Minister of an Underwater Cultural Heritage discovery through the Australasian Underwater Cultural Heritage Database tool. Addressed in (Table 7-2, CM-2.2).
Notification (email)	Director of National Parks (DNP)	As requested by DNP.	Within 24 hours of an unplanned oil spill event.	DNP requested Marine Compliance Duty Officer be notified of any spill or pollution.
Updates (email)			As required.	DNP requested an update should the operational area change.

Report	Recipient	Purpose	Frequency	Content
Notification (email)	DBCA	As requested by DBCA.	As required.	VOGA to contact DBCA's Pilbara regional office in the event of a hydrocarbon release during the activity.
Notification (call and email)	DoT – Marine Pollution	As requested by DoT.	As soon as reasonably practical (within 2 hours).	In the risk of a spill impacting state waters to DoT Maritime Environmental Emergency Response (MEER) Duty Officer via the 24-hour reporting number (08) 9480 9924. The initial verbal notification must be followed up by an email containing a marine pollution report (POLREP), or similar, to marine.pollution@transport.wa.gov.au. As per Guidance Note from July 2020 titled Marine Oil Pollution: Response and Consultation Arrangements.
Notification (email)	Pilbara Ports Authority (PPA)	As requested by PPA.	As soon as practicable.	PPA to be notified if an unplanned event occurs.
Notification (email)	WAFIC	As requested by WAFIC.	No less than 10 days prior to commencement of activities.	Date of activity start. Addressed in (Table 7-2, CM-1.2).
			Within 24 hours of an unplanned Level 2 oil spill event.	WAFIC to be notified in the event of a Level 2 oil spill.
Ongoing engagement	Recfishwest	As requested by Recfishwest.	Ongoing.	Project progress update, including date of activity start.
Updates (email)	Shire of Ashburton	As requested by the Shire of Ashburton.	As required.	Project progress update, including date of activity start.
Notification (email)	Other relevant persons	Notification of significant change.	As appropriate.	Notification of significant change.
Emails/Meetings	Persons or organisations who provide feedback to	Identification, assessment and consideration of	As appropriate.	Assessment of claims and/or objections. VOGA will apply its MoC process, where appropriate (Section 8.5).

Report	Recipient	Purpose	Frequency	Content
	VOGA post EP submission.	feedback, claims and/or objections.		
Updates (email)	Ngarluma Aboriginal Corporation	As requested by Ngarluma Aboriginal Corporation	As soon as practicable.	Ngarluma Aboriginal Corporation to be notified in the event of an oil spill.
Updates (email)	Wanparta Aboriginal Corporation	As requested by Wanparta Aboriginal Corporation	As soon as practicable.	Wanparta Aboriginal Corporation to be notified in the event of an oil spill.

Figure 9-2: VOGA's ongoing consultation process



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Appendices

Appendix A VOGA Health, Safety and Environment (HSE) Policy

HEALTH, SAFETY AND ENVIRONMENT (HSE) POLICY

Vermilion is committed to ensuring we conduct our activities in a manner that protects the health and safety of our employees, our contractors and the public. Our HSE Vision is to consistently apply our Core Values of Excellence, Trust, Respect and Responsibility. This results in a workplace free of incidents and ensures that our proactive culture and behaviours create a high-reliability organization where HSE is fully integrated into our business – it is our way of life.

Vermilion will maintain health, safety and environmental practices and procedures that comply with or exceed regulatory requirements and industry standards.

Our commitments to achieving strong HSE performance include:

- Maintaining an integrated Management System with clear objectives and expectations to identify hazards and manage risks
- Ensuring visible active commitment from leaders at all levels of the organization to meet our HSE performance targets
- Providing every employee and contractor with a safe and healthy workplace
- Ensuring we nurture our ownership culture where all employees and contractors have a high level of responsibility to HSE
- Prioritizing a culture where everyone is empowered to speak up and promote safe behaviours and environmental protection
- Continuously evaluating and improving our management systems, standards and operating practices and procedures
- Making a positive contribution to the protection of the environment and seeking improvements in the efficient use of natural resources
- Providing ongoing training and competency assessments to ensure safe operations
- Ensuring open and timely communication with all stakeholders, and
- Ensuring the resources necessary to support this policy are provided.

Hazard awareness, risk reduction and environmental stewardship comprise an integral part of any job. This is a joint effort that requires continuous support from everyone who works at Vermilion. The protection of health, safety and the environment must be a key part of the planning and execution of every task. All those engaged in work for Vermilion shall be aware of this policy and conduct their duties and behaviours in alignment with these principles.

HSE: Everyone. Everywhere. Everyday.

Dion Hatcher
President

Darcy Kerwin
Vice President, International & HSE

Ryan Carty
Managing Director,
Australia Business Unit

VERMILION ENERGY

2024

Appendix B Oil Spill Modelling Report

VERMILION KULLINGAL OIL SPILL MODELLING

Report

GOC367176
Final
20 December 2024

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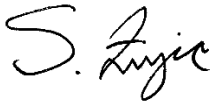
Dr. Sasha Zigic  20 December 2024

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TERMS AND ABBREVIATIONS

Term	Meaning
Actionable oil	Oil which is thick enough for the effective use of mitigation strategies.
AMSA	Australian Maritime Safety Authority
API	American Petroleum Institute gravity. A measure of how heavy or light a petroleum liquid is compared to water.
Bonn Agreement	An agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances, established 1983 includes: Governments of the Kingdom of Belgium, the Kingdom of Denmark, the French Republic, the Federal Republic of Germany, the Republic of Ireland, the Kingdom of the Netherlands, the Kingdom of Norway, the Kingdom of Sweden, the United Kingdom of Great Britain and Northern Ireland and the European Union.
BP	Boiling point. The temperature at which the vapor pressure of the liquid is equal to the pressure exerted on it by the surrounding atmosphere
BTEX	Benzene, toluene, ethylbenzene, and xylenes
Decay	The process where oil components are changed either chemically or biologically (biodegradation) to another compound. It includes breakdown to simpler organic carbon compounds by bacteria and other organisms, photo-oxidation by solar energy, and other chemical reactions.
Deterministic (single) Oil spill modelling	Oil spill modelling involving a computer simulation of a single hypothetical oil spill event subject to a single sequence of wind, current and other sea conditions over time. Single oil spill modelling, also referred to as “deterministic modelling” provides a simulation of one possible outcome of a given spill scenario, subject to the metocean conditions that are imposed. Single oil spill modelling is commonly used to consider the fate and effects of ‘worst-case’ oil spill scenarios that are carefully selected in consideration of the nature and scale of the offshore petroleum activity and the local environment (NOPSEMA, 2018). Because the outcomes of a single oil spill simulation can only represent the outcome of that scenario under one sequence of metocean conditions, worst-case conditions are often identified from stochastic modelling. It is impossible to calculate the likelihood of any outcome from a single oil spill simulation. Single oil spill modelling is generally used for response planning, preparedness planning and for supporting oil spill response operations in the event of an actual spill
Dynamic viscosity	The dynamic viscosity of a fluid expresses its resistance to shearing flows, where adjacent layers move parallel to each other with different speeds.
Floating oil exposure	Contact by floating oil on the sea surface at concentrations equal to or exceeding defined threshold concentrations. The consequence will vary depending on the threshold and the receptors
HYCOM	Hybrid Coordinate Ocean Model. A data-assimilative, three-dimensional ocean model
HYDROMAP	Advanced ocean/coastal tidal model used to predict tidal water levels, current speed and current direction.
MAHs	Monoaromatic hydrocarbons
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
PAH	Polynuclear aromatic hydrocarbons
Pour Point	The pour point of a liquid is the temperature below which the liquid loses its flow characteristics
Shoreline accumulation	Arrival of oil at or near shorelines at on-water concentrations equal to or exceeding defined threshold concentrations. Shoreline accumulation is judged for floating oil arriving within a 2 km buffer zone from any shoreline as a conservative measure.
SIMAP	Spill Impact Model Application Package. SIMAP is designed to simulate the fate and effects of spilled hydrocarbons for surface or subsea releases.
Stochastic (multiple) oil spill modelling	Stochastic oil spill modelling is created by overlaying and statistically analysing the outcomes of many single oil-spill simulations of a defined spill scenario, where each simulation was subject to a different sequence of metocean conditions, selected objectively (typically by random selection) from a long sequence of historic conditions for the study area. Analysis of this larger set of simulations provides a more accurate indication of the areas of potential exposure and indicates which locations are more likely to be exposed (as well as other statistics). Stochastic oil spill

	modelling avoids biases that affect single oil spill modelling (due to the reliance on only one possible sequence of conditions). However, when interpreting stochastic modelling, which is based on a wide range of potential conditions that might happen to occur, it is essential to understand that calculations will encompass a much larger area than could be affected in any single spill event, where a more limited set of conditions will occur. Consequently, it is misleading to imply that the region derived from stochastic modelling indicate the outcomes expected from a single spill event (NOPSEMA, 2018) Stochastic modelling is generally used for risk assessment and preparedness planning by indicating locations that could be exposed and may require response or subsequent impact assessment.

EXECUTIVE SUMMARY

Background

Vermilion Oil and Gas Australia Pty Ltd (VOGA) operates the Wandoo field, located approximately 70 km northwest of Dampier, Western Australia, in waters approximately 50 m deep.

To support the preparation of the Environment Plan (EP) and Oil Pollution Emergency Plan (OPEP) for the Kullingal well exploration drilling activity, a detailed oil spill modelling study was commissioned. This study assessed the following two hypothetical scenarios:

- **Scenario 1:** A 167,800 bbl (26,678 m^3) surface release of Wandoo crude over 35 days following a loss of well control (LOWC) at Kullingal; and
- **Scenario 2:** A 300 m^3 surface release of marine diesel oil (MDO) over 6 hours following a vessel collision at Kullingal.

The potential exposure of surrounding waters and shorelines was assessed and presented for the distinct seasons, summer (October to February), winter (April to July) and transitional (March, August and September). The modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill.

Methodology

The modelling study was carried out in stages. Firstly, a 10-year wind and current dataset (2010–2019) that includes the combined influence of large-scale ocean and tidal currents was prepared. Secondly, the currents, local winds and detailed hydrocarbon characteristics were used as inputs in the three-dimensional oil spill model (SIMAP) to simulate the drift, spread, weathering and fate of the spilled oil.

Modelling was conducted using a stochastic (or probabilistic) approach, which involved running 100 spill simulations per season and each simulation had the same spill information (spill volume, duration and composition of hydrocarbons) but randomly selected start times to ensure a range of wind and current conditions were assessed. Once all 100 simulations per season were run, the results were combined to determine the potential exposure to the surrounding waters, shorelines and sensitive receptors based on the thresholds outlined in the NOPSEMA Oil Spill Modelling Bulletin (NOPSEMA, 2019).

Oil Properties

Wandoo Crude (API 19.4) was used for this oil spill modelling study. The unweathered mixture has a density of 937.7 g/cm^3 (at 16°C), a dynamic viscosity of 161 cP and a pour point of -24°C, which ensures that this crude will remain in a liquid state over the annual temperature range observed.

Wandoo Crude is composed of approximately 1.7% (by mass) of volatile hydrocarbons that will evaporate within the first 12 hours. A further 10.2% of the oil is characterised as the semi-volatile compounds that will likely evaporate within the first 24 hours when on the surface and the additional 33.1% represent the low volatiles which typically evaporate over several weeks. A relatively high proportion (55%) of hydrocarbon compounds is persistent, which are unlikely to evaporate and will decay over time. It is categorised as a Group IV (or persistent) oil according to both oil classifications for AMSA (2023).

The MDO has a density of 890.0 kg/m^3 at 15ºC (API of 27.5) and a low pour point of -9.0°C. The low viscosity (14.0 cP at 25ºC) indicates that this oil will spread quickly when released and will form a thin to low thickness film on the sea surface, increasing the rate of evaporation. Generally, about 4% of the MDO mass should evaporate within the first 12 hours (Boiling point (BP) < 180°C); a further 32.0% should evaporate within the first 24 hours (180°C < BP < 265°C); and an additional 54.0% should evaporate over several days (265°C < BP < 380°C). Approximately 10% (by mass) of MDO will not evaporate, though will decay slowly over time. It is categorised as a Group II oil (light-persistent) according to the AMSA (2023) classifications.

Summary of Modelling Results

A detailed summary of the results for all modelled scenarios is provided in the table below.

Summary of key results

Scenario description		Scenario 1 – Surface LOWC	Scenario 2 - Vessel collision
Spill volume		167,800 bbl (26,678 m^3)	300 m^3
Oil type		Wandoo crude	MDO
Release depth		0 m (surface)	0 m (surface)
Release duration		35 days	6 hours
Simulation length		56 days	30 days
Floating Oil Exposure	Maximum distances from the release location to floating oil exposure thresholds	Floating oil concentrations ≥ 1 g/m^2 could extend up to 998 km from the release location. The maximum distances reduced to 473 km and 25 km as the threshold increases to ≥ 10 g/m^2 and ≥ 50 g/m^2, respectively.	Floating oil concentrations ≥ 1 g/m^2 could extend up to 31 km from the release location. The maximum distances reduced to 18 km and 6 km as the threshold increases to ≥ 10 g/m^2 and ≥ 50 g/m^2, respectively.
	Highest probability of floating oil exposure to a receptor at, or above, 1 g/m^2	Mermaid Reef AMP, 97% during winter conditions	NC
	Quickest time before exposure to a receptor at, or above, 1 g/m^2	Montebello AMP, 37 hours during transitional conditions	NC
Shoreline Oil Accumulation	Probability of oil accumulation on **any** shoreline at, or above, 10 g/m^2	100% during winter conditions	24% during winter conditions
	Absolute minimum time for oil to accumulate on shoreline cells at ,or above, 10 g/m^2	WA11.West (318) - Barrow Island and Montebello Islands (A), 69 hours during winter conditions	WA11.West (318) - Barrow Island and Montebello Islands (A), 91 hours during winter conditions
	Maximum volume of oil ashore from a single spill simulation at, or above, 10 g/m^2	4,550.0 m^3 during summer conditions	23.2 m^3 during winter conditions
	Highest probability of oil accumulation for a specific shoreline cell at, or above, 10 g/m^2	WA11.West (318) - Barrow Island and Montebello Islands (A), 92% during winter conditions	WA11.West (318) - Barrow Island and Montebello Islands (A), 15% during winter conditions
	Maximum volume of oil ashore from a single spill simulation for a specific shoreline cell at, or above, 10 g/m^2	2,570 m^3, WA11.West (318) - Barrow Island and Montebello Islands (A), during transitional conditions	23.2 m^3, WA11.West (318) - Barrow Island and Montebello Islands (A), during winter conditions

Dissolved Hydrocarbons	Maximum distances from the release location to dissolved hydrocarbon exposure thresholds	Concentrations ≥ 10 ppb threshold may extend up to 790 km from the release location. As the threshold increases to 50 ppb, the maximum distance decreases to 425 km. No exposure was predicted above 400 ppb.	Concentrations ≥ 10 ppb threshold may extend up to 169 km from the release location. As the threshold increases to 50 ppb, the maximum distance decreases to 58 km. No exposure was predicted above 400 ppb.
	Highest probability of dissolved hydrocarbon exposure to a receptor at, or above, 10 ppb	Montebello AMP, 89% during winter conditions	Montebello AMP, 7% during winter conditions
	Quickest time before exposure to a receptor at, or above, 10 ppb	Montebello AMP, 26 hours during summer conditions	Montebello AMP, 27 hours during transitional conditions
Entrained Hydrocarbons	Maximum distances from the release location to entrained hydrocarbons exposure thresholds	Concentrations ≥ 10 ppb threshold may extend up to 1,302 km from the release location. As the threshold increases to ≥ 100 ppb, the maximum distance decreases to 1,037 km.	Concentrations ≥ 10 ppb threshold may extend up to 494 km from the release location. As the threshold increases to ≥ 100 ppb, the maximum distance decreases to 237 km.
	Highest probability of entrained hydrocarbon exposure to a receptor at, or above, 10 ppb	Montebello AMP, 99% during winter conditions	Montebello AMP, 54% during winter conditions
	Quickest time before exposure to a receptor at, or above, 10 ppb	Montebello AMP, 21 hours during summer and winter conditions	Montebello AMP, 22 hours during winter conditions

NC: No contact to receptor predicted for specified threshold.

1 INTRODUCTION

1.1 Background

Vermilion Oil and Gas Australia Pty Ltd (VOGA) operates the Wandoo field, located approximately 70 km northwest of Dampier, Western Australia, in waters approximately 50 m deep.

To support the preparation of the Environment Plan (EP) and Oil Pollution Emergency Plan (OPEP) for the Kullingal well exploration drilling activity, a detailed oil spill modelling study was commissioned. This study assessed the following two hypothetical scenarios:

- **Scenario 1:** A 167,800 bbl (26,678 m^3) surface release of Wandoo crude over 35 days following a loss of well control (LOWC) at Kullingal; and
- **Scenario 2:** A 300 m^3 surface release of marine diesel oil (MDO) over 6 hours following a vessel collision at Kullingal.

The coordinates for the Kullingal well, which was used as the release location for the two scenarios are presented in Table 1.1 and is illustrated in Figure 1.1.

The potential exposure of surrounding waters and shorelines was assessed and presented for the distinct seasons, summer (October to February), winter (April to July) and transitional (March, August and September).

The spill modelling was performed using an advanced three-dimensional trajectory and fates model; Spill Impact Model Application Package (SIMAP). The SIMAP model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbons over time, based on the prevailing wind and current conditions and the physical and chemical properties. The modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill.

The hydrocarbon spill model, the method and analysis applied herein use modelling algorithms which have been peer reviewed and published in international journals. Further, RPS warrants that this work meets and exceeds the American Society for Testing and Materials (ASTM) Standard F2067-22 "*Standard Practice for Development and Use of Oil Spill Models*".

Table 1.1 Coordinates of the oil spill modelling release location.

Release site	Latitude*	Longitude*	Water Depth (m)
Kullingal	20° 10' 16.32" S	116° 24' 11.88" E	50

*Datum: WGS 1984

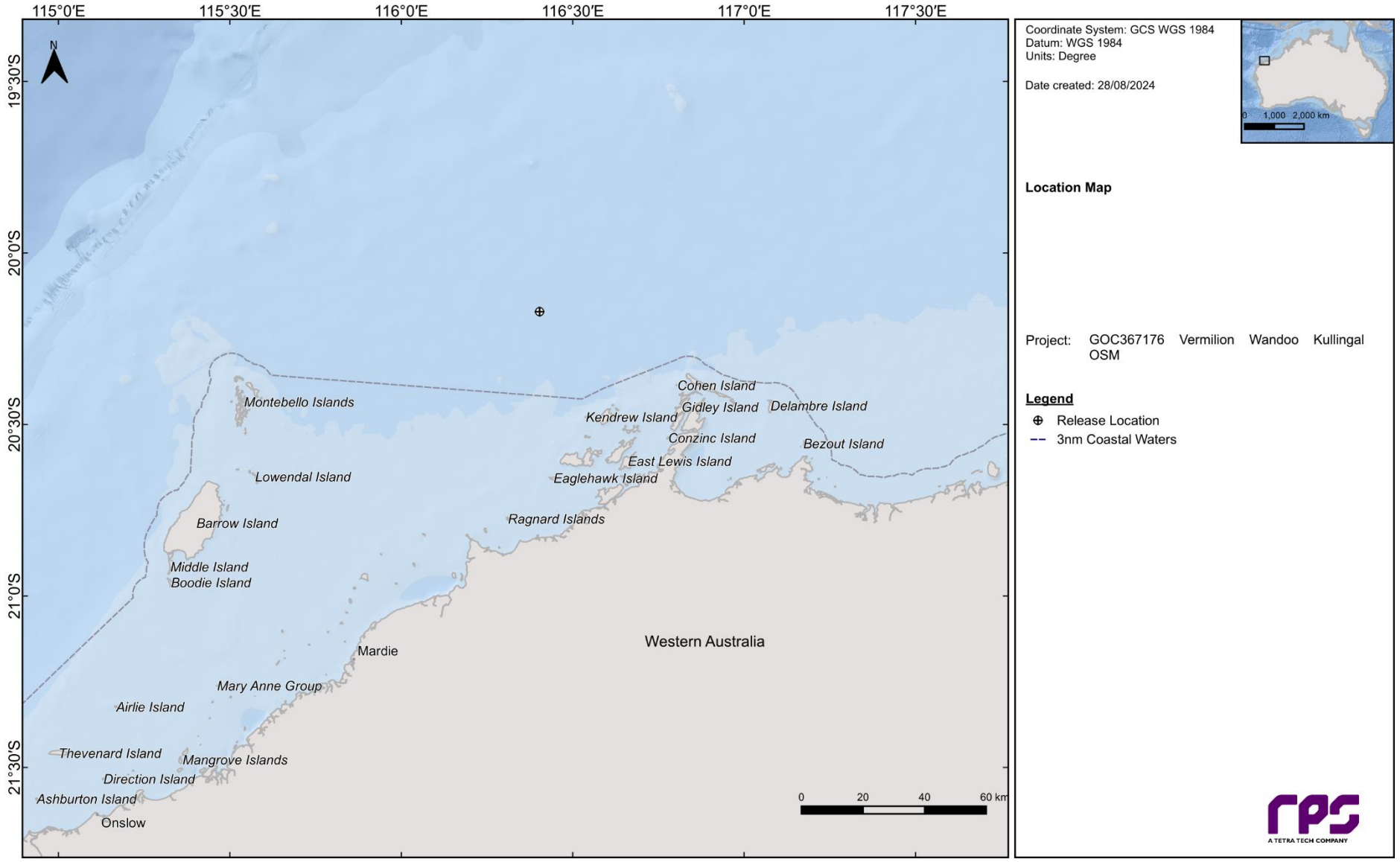

Figure 1.1 Map of the oil spill modelling release location.

What is Oil Spill Modelling?

Oil spill modelling is a valuable tool widely used for risk assessment, emergency response and contingency planning where it can be particularly helpful to proponents and decision makers. By modelling a series of the most likely oil spill scenarios, decisions concerning suitable response measures and strategic locations for deploying equipment and materials can be made, and the locations at most risk can be identified. The two types of oil spill modelling often used are stochastic and deterministic modelling.

1.1.1 Stochastic Modelling (Multiple Spill Simulations)

Stochastic oil spill modelling is created by overlaying a great number (often hundreds) of individual, computer-simulated hypothetical spills (NOPSEMA, 2018; Figure 1.2).

Stochastic modelling is a common means of assessing the potential risks from oil spills related to new projects and facilities. Stochastic modelling typically utilises hydrodynamic data for the location in combination with historic wind data. Typically, 100 simulations are run, which sufficiently samples the historic dataset that is most relevant to the season or timing of the project.

The outcomes are often presented as a probability of exposure and are primarily used for risk assessment purposes in view to understand the range of environments that may be affected or impacted by a spill. Elements of the stochastic modelling can also be used in oil spill preparedness and planning.

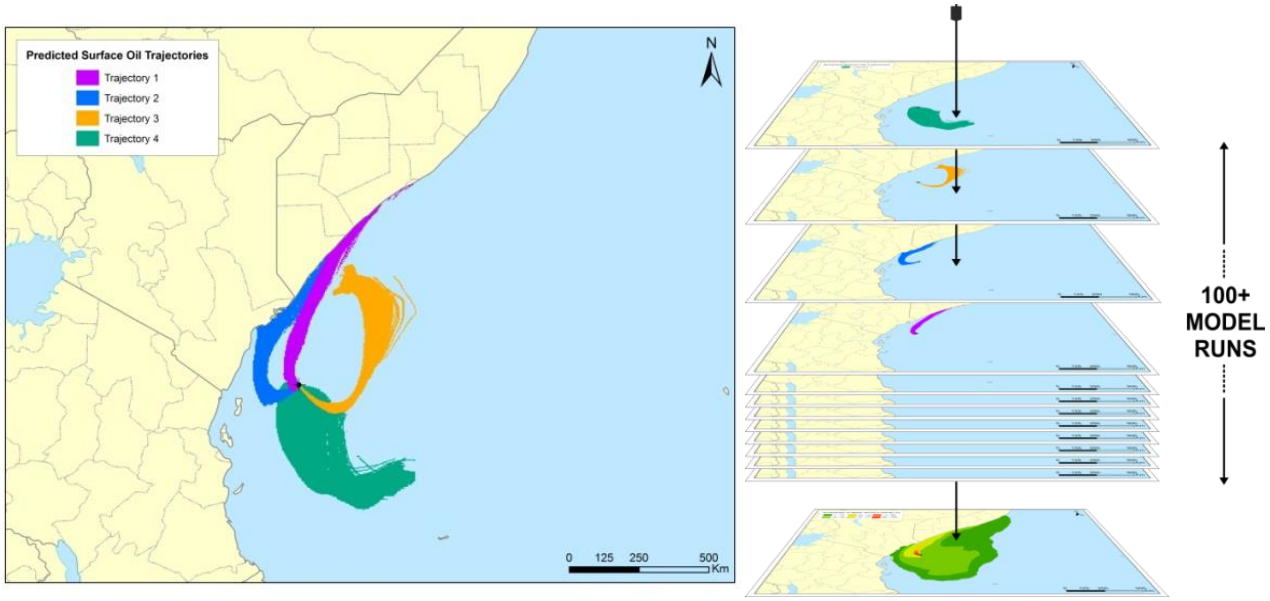

Figure 1.2 Examples of four individual spill trajectories (four replicate simulations) predicted by SIMAP for a spill scenario (left pane). The frequency of contact for given locations is used to calculate the probability of impacts during a spill. Essentially, all model runs are overlain (shown as the stacked runs on the right) and the number of times that trajectories contact a given location at a concentration is used to calculate the probability.

2 SCOPE OF WORK

The scope of work included the following components:

1. Generate 10 years (2010 to 2019 (inclusive)) of wind and current data. The three-dimensional current data includes the combined influence of ocean and tidal currents;
2. Include the wind data, current data and oil properties into the three-dimensional oil spill model; SIMAP, to model the movement, spreading, entrainment, weathering and potential shoreline accumulation over time;
3. Run 100 simulations per season (300 simulations in total) for each scenario, with each scenario specific simulation having the same spill information (location, volume, duration and crude properties) but randomly varying start times. This ensured that each spill simulation was exposed to unique wind and current conditions;
4. Combine the results from the 100 spill simulations per season for each scenario to determine the potential exposure to the surrounding waters, shorelines and sensitive receptors based on the thresholds outlined in the NOPSEMA Oil Spill Modelling Bulletin (NOPSEMA, 2019); and
5. To inform spill response and Operational and Scientific Monitoring (OSM) Bridging Implementation Plan (BIP) capability requirements, the following deterministic simulation for the LOWC scenario was identified and presented:
    a. Greatest number of receptors with floating oil exposure at or above 1 g/m^2 within the first 7 days.

3 REGIONAL CURRENTS

The area of interest for this study is typified by strong tidal flows over the shallower regions, particularly along the inshore region of the North West Shelf and among the island groups stretching from the Dampier Archipelago to the North West Cape. However, the offshore regions with water depths exceeding 100 m – 200 m experience significant large-scale drift currents. These drift currents can be relatively strong (1 knot – 2 knots) and complex, manifesting as a series of eddies, meandering currents, and connecting flows. These offshore drift currents also tend to persist longer (days to weeks) than tidal current flows (hours between reversals) and thus will have greater influence upon the net trajectory of slicks over time scales exceeding a few hours.

Wind shear on the water surface also generates local-scale currents that can persist for extended periods (hours to days) and result in long trajectories. Hence, the current-induced transport of oil can be variably affected by combinations of tidal, wind-induced, and density-induced drift currents. Depending on their local influence, it is critical to consider all these potential advective mechanisms to rigorously understand patterns of potential transport from a given spill location. A comprehensive description of the circulation patterns of the North West Shelf is provided in a review by Condie & Andrewartha (2008).

A schematic of the ocean currents along the North West Australian continental shelf is shown in Figure 3.1.

While the tidal currents are generally weaker in the deeper waters, their influence is greatest along the near shore, coastal passage regions and, in and around islands. Therefore, to accurately account for the movement of an oil spill, which can move between the nearshore and offshore region, ocean and tidal currents were combined as part of the study.

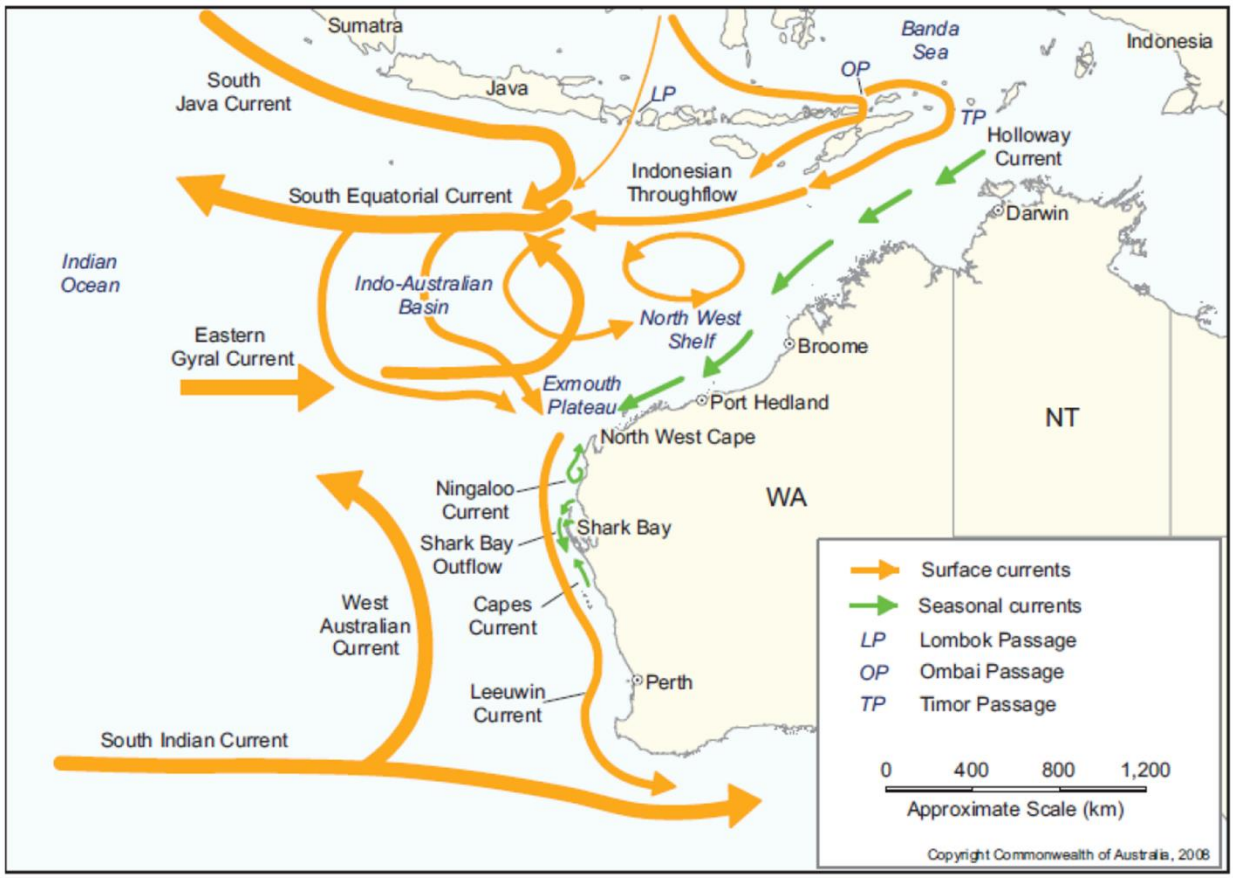

Figure 3.1 Schematic of ocean currents along the northwestern Australian continental shelf. Image adapted from DEWHA (2008).

3.1 Tidal Currents

The effects of tides were generated using RPS's advanced ocean/coastal model, HYDROMAP. The HYDROMAP model has been thoroughly tested and verified through field measurements throughout the world for over 35 years (Isaji and Spaulding, 1984; Isaji et al., 2001; Zigic et al., 2003; Makarynskyy et al., 2010), whilst being used for a wide variety of disciplines within marine environments (e.g. Zigic et al., 2003; Talouli et al., 2009; Zigic et al., 2009; King et al., 2010; Makarynskyy et al., 2010; 2015). In fact, HYDROMAP tidal current data have been used as input for the OILMAP hydrocarbon spill modelling system, which forms part of the Incident Management System (IMS) operated by Maritime New Zealand (MNZ), Australian Maritime Safety Authority (AMSA) and the United Kingdom Maritime and Coastguard Agency, as well as several major oil and gas companies.

HYDROMAP employs a sophisticated sub-gridding strategy, which supports up to six levels of spatial resolution, halving the grid cell size as each level of resolution is employed. The sub-gridding allows for higher resolution of currents within areas of greater bathymetric and coastline complexity, and/or of particular interest to a study.

The numerical solution methodology follows that of Davies (1977a and 1977b) with further developments for model efficiency by Owen (1980) and Gordon (1982). A more detailed presentation of the model can be found in Isaji and Spaulding (1984) and Isaji et al. (2001).

3.1.1 Grid Setup

The tidal model domain has been sub-gridded to a resolution of 500 m for shallow and coastal regions, starting from an offshore (or deep water) resolution of 8 km. The finer grids were allocated in a step-wise fashion to resolve flows more accurately along the coastline, around islands and over regions with more complex bathymetry. Figure 3.2 shows the tidal model grid resolutions.

A combination of datasets was used and merged to describe the shape of the seabed within the grid domain (Figure 3.3). These included spot depths and contours which were digitised from nautical charts released by the hydrographic offices as well as Geoscience Australia database, and depths extracted from the Shuttle Radar Topography Mission (SRTM30_PLUS) Plus dataset (see Becker et al., 2009).

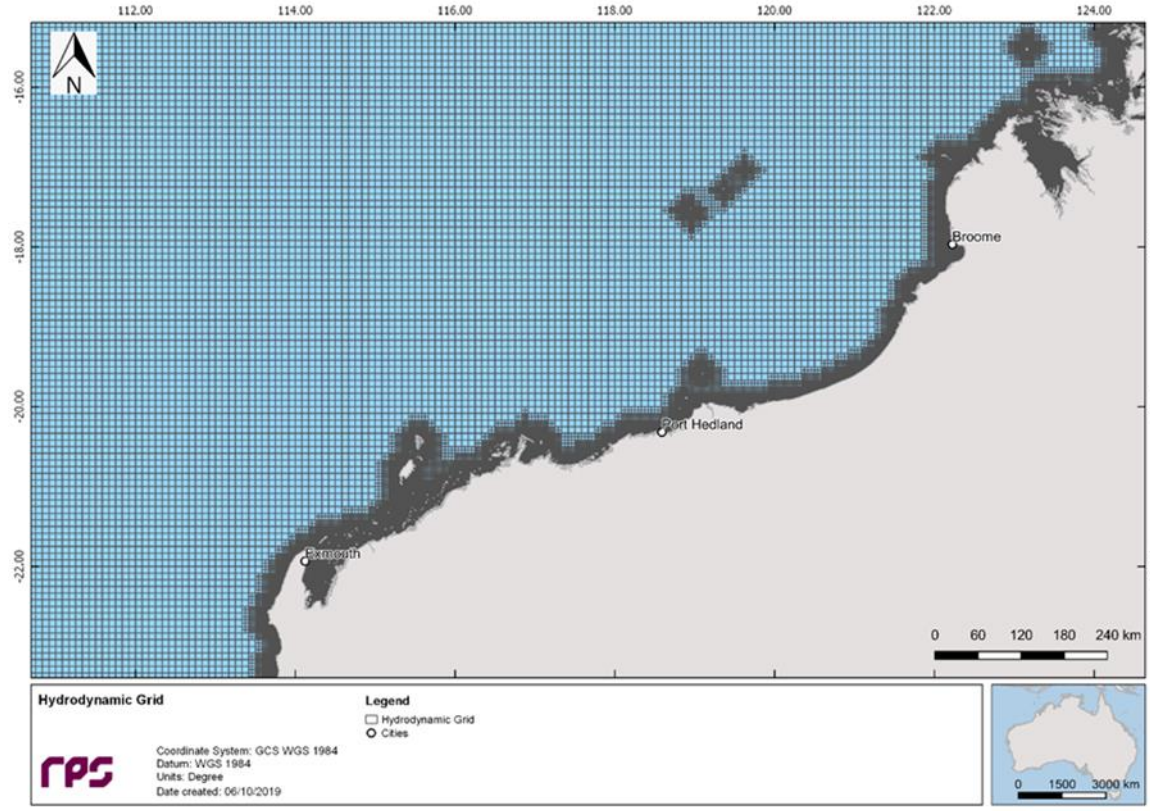

Figure 3.2 Zoomed in view of the model grid used to generate the tidal currents for the study region. Higher resolution areas are shown by the denser mesh.

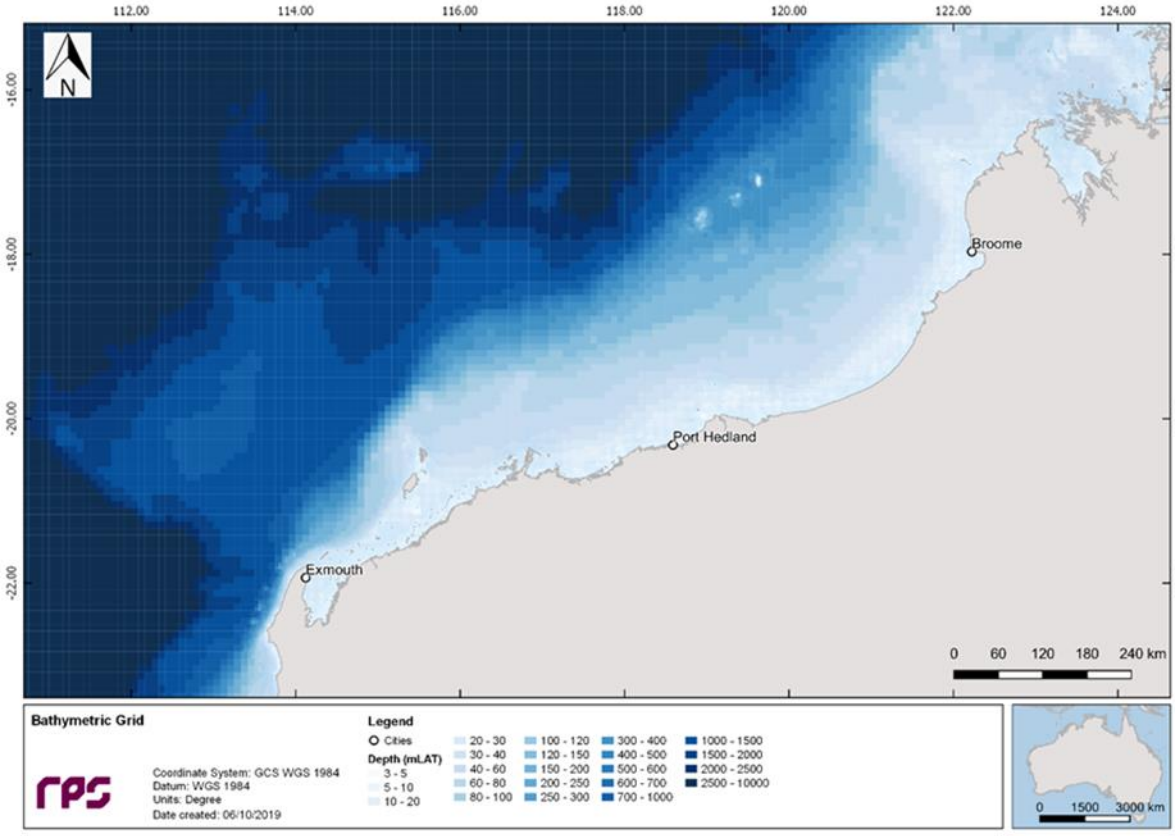

Figure 3.3 Bathymetry defined throughout the tidal model domain.

3.1.2 Tidal Conditions

The ocean boundary data for the regional model was obtained from satellite measured altimetry data (TOPEX/Poseidon 7.2) which provided estimates of the eight dominant tidal constituents at a horizontal scale of approximately 0.25 degrees. The eight major tidal constituents used were K_2, S_2, M_2, N_2, K_1, P_1, O_1 and Q_1. Using the tidal data, surface heights were firstly calculated along the open boundaries, at each time step in the model.

The TOPEX/Poseidon satellite data have a global resolution of 0.25 degrees and is produced and quality controlled by NASA (National Aeronautics and Space Administration). The satellites equipped with two highly accurate altimeters and capable of taking sea level measurements with an accuracy of ± 5 cm measured oceanic surface elevations (and the resultant tides) for over 13 years (1992–2005). In total, these satellites carried out 62,000 orbits of the planet.

The Topex-Poseidon tidal data have been extensively reported and utilised within the oceanographic community (e.g. Andersen, 1995; Ludicone et al., 1998; Matsumoto et al., 2000; Kostianoy et al., 2003; Yaremchuk and Tangdong, 2004; Qiu and Chen 2010; Amores et al., 2019; Sagnieres et al., 2020; Veng et al., 2021; Zeitlhöfler et al., 2023). As such the Topex/Poseidon tidal data is considered suitably accurate for this study.

3.2 Ocean Currents

Data describing the flow of ocean currents were obtained from HYCOM (Hybrid Coordinate Ocean Model, (Chassignet et al., 2007), which is operated by the HYCOM Consortium, sponsored by the National Ocean Partnership Program (NOPP), as part of the U.S. Global Ocean Data Assimilation Experiment (GODAE). HYCOM is a data-assimilative, three-dimensional ocean model that is run as a hindcast (for a past period), assimilating time-varying observations of sea surface height, sea surface temperature and in-situ temperature and salinity measurements (Chassignet et al., 2009). The HYCOM predictions for drift currents are produced at a horizontal spatial resolution of approximately 8.25 km (1/12th of a degree) over the region, at a frequency of every 3 hours. HYCOM uses isopycnal layers in the open, stratified ocean, but uses the layered continuity equation to make a dynamically smooth transition to a terrain following coordinate in shallow coastal regions, and to z-level coordinates in the mixed layer and/or unstratified seas.

For this study, the HYCOM hindcast currents were obtained for the years 2010 to 2019 (inclusive).

3.3 Surface Currents

Figure 3.4 and Figure 3.5 present the monthly and total current rose plots, respectively, for surface waters adjacent to the release location.

Note the convention for defining current direction throughout this report is the direction the current flows towards. Each branch of the current rose distribution represents the currents flowing to that direction, with north to the top of the diagram. The branches are divided into segments of different colour, which represent the current speed ranges for each direction. Speed intervals of 0.2 m/s are typically used in these current roses. The length of each coloured segment within a branch is proportional to the frequency of currents flowing within the corresponding speed and direction.

The average and maximum current speeds were 0.25 m/s and 2.07 m/s, respectively. Throughout the year, the dominant current directions were northwest and southeast, primarily driven by tidal currents rather than ocean currents, given the release location's proximity to shore and shallow waters.

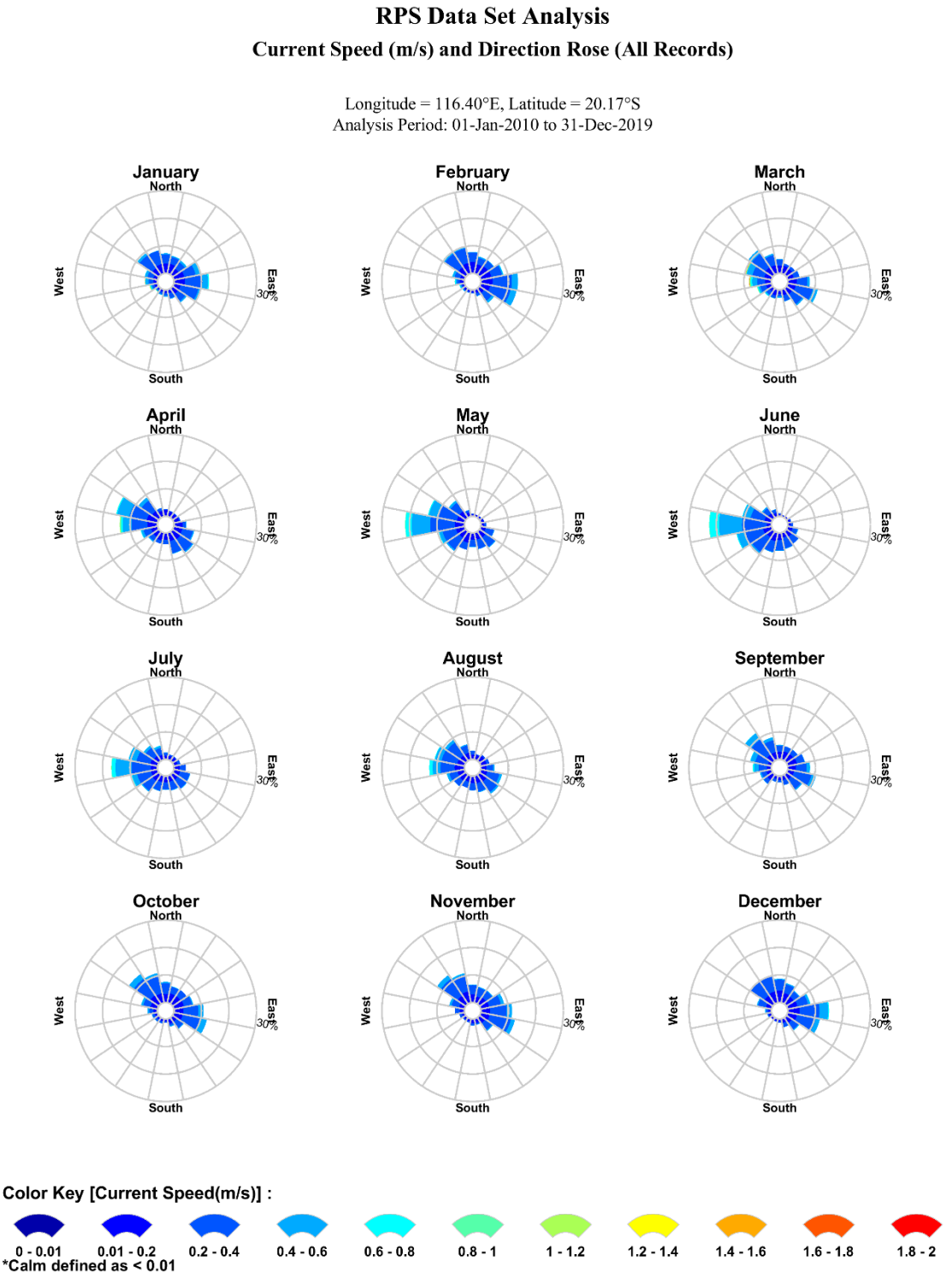

Figure 3.4 Monthly surface current rose plots adjacent to the release location, derived from the 2010 to 2019 modelled dataset.

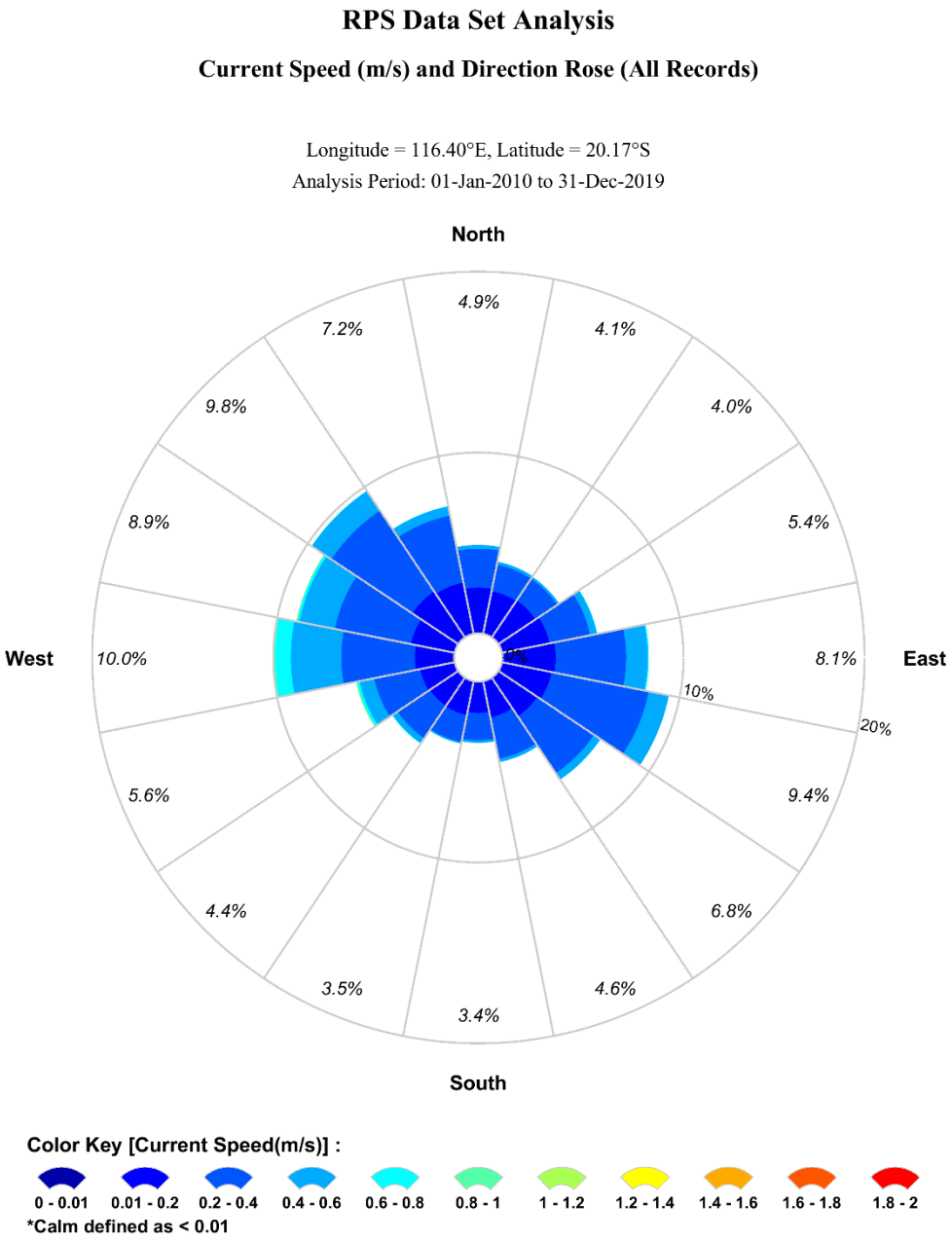

Figure 3.5 Total surface current rose plots adjacent to the release location, derived from the 2010 to 2019 modelled dataset.

4 WIND DATA

To account for the influence of the wind on the floating oil, wind data from 2010 to 2019 (inclusive) was sourced from the National Centre for Environmental Prediction (NCEP) Climate Forecast System Reanalysis (CFSR; see Saha et al., 2010). The CFSR wind model includes observations from many data sources; surface observations, upper-atmosphere air balloon observations, aircraft observations and satellite observations. The model is capable of accurately representing the interaction between the earth's oceans, land and atmosphere. The gridded wind data output is available at ¼ of a degree resolution (~33 km) and 1-hourly time intervals. Figure 4.1 shows the spatial resolution of the wind field used as input into the oil spill model.

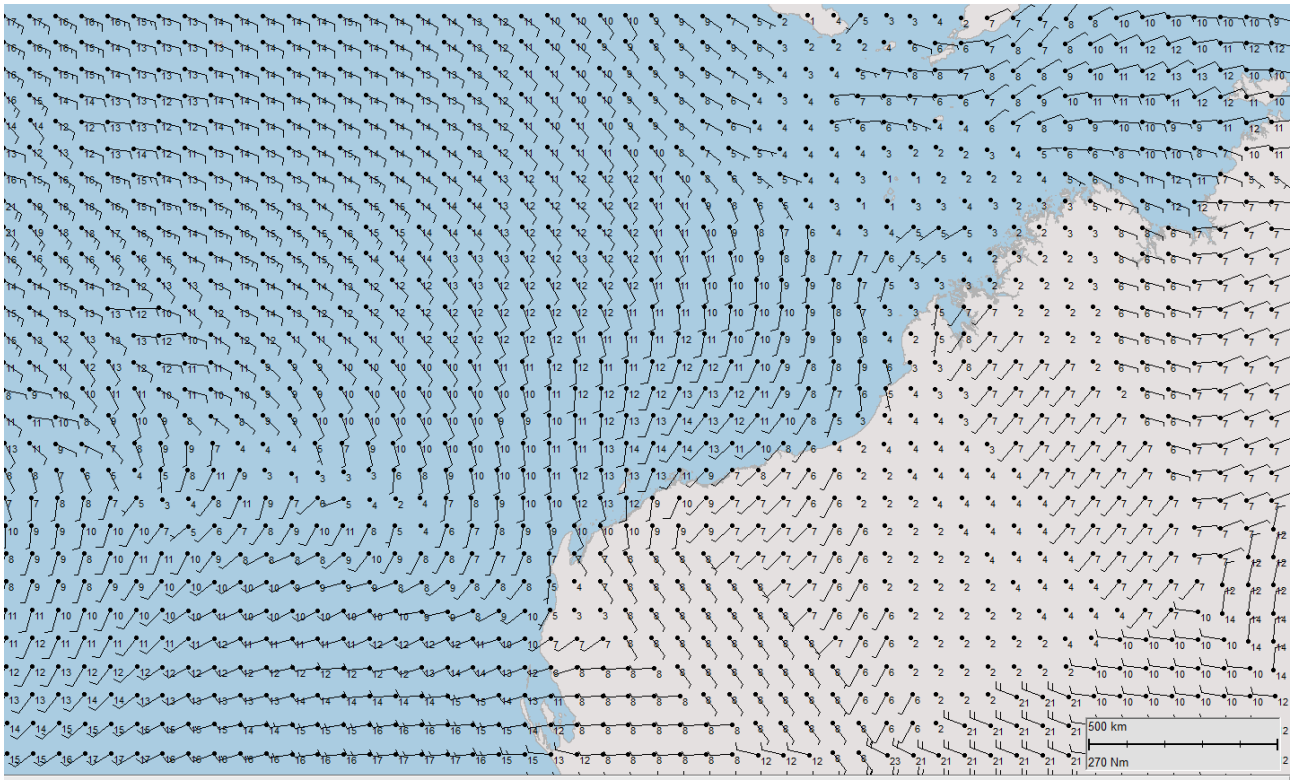

Figure 4.1 Spatial resolution of the CFSR modelled wind data used as input into the oil spill model. Note, for ease viewing only every second wind vector is displayed on the map.

Figure 4.2 and Figure 4.3 illustrate the monthly and total wind rose plots, respectively, adjacent to the release location.

Note that the atmospheric convention for defining wind direction, that is, the direction the wind blows from, is used to reference wind direction throughout this report. Each branch of the rose represents wind coming from that direction, with north to the top of the diagram. Sixteen directions are used. The branches are divided into segments of different colour, which represent wind speed ranges from that direction. Speed ranges of 5 knot intervals are typically used in these wind roses. The length of each segment within a branch is proportional to the frequency of winds blowing within the corresponding range of speeds from that direction.

The average and maximum wind speeds were 12.2 knots and 52.3 knots, respectively. Winds typically blow from the west-southwest during the summer months, while in winter, they predominantly come from the east.

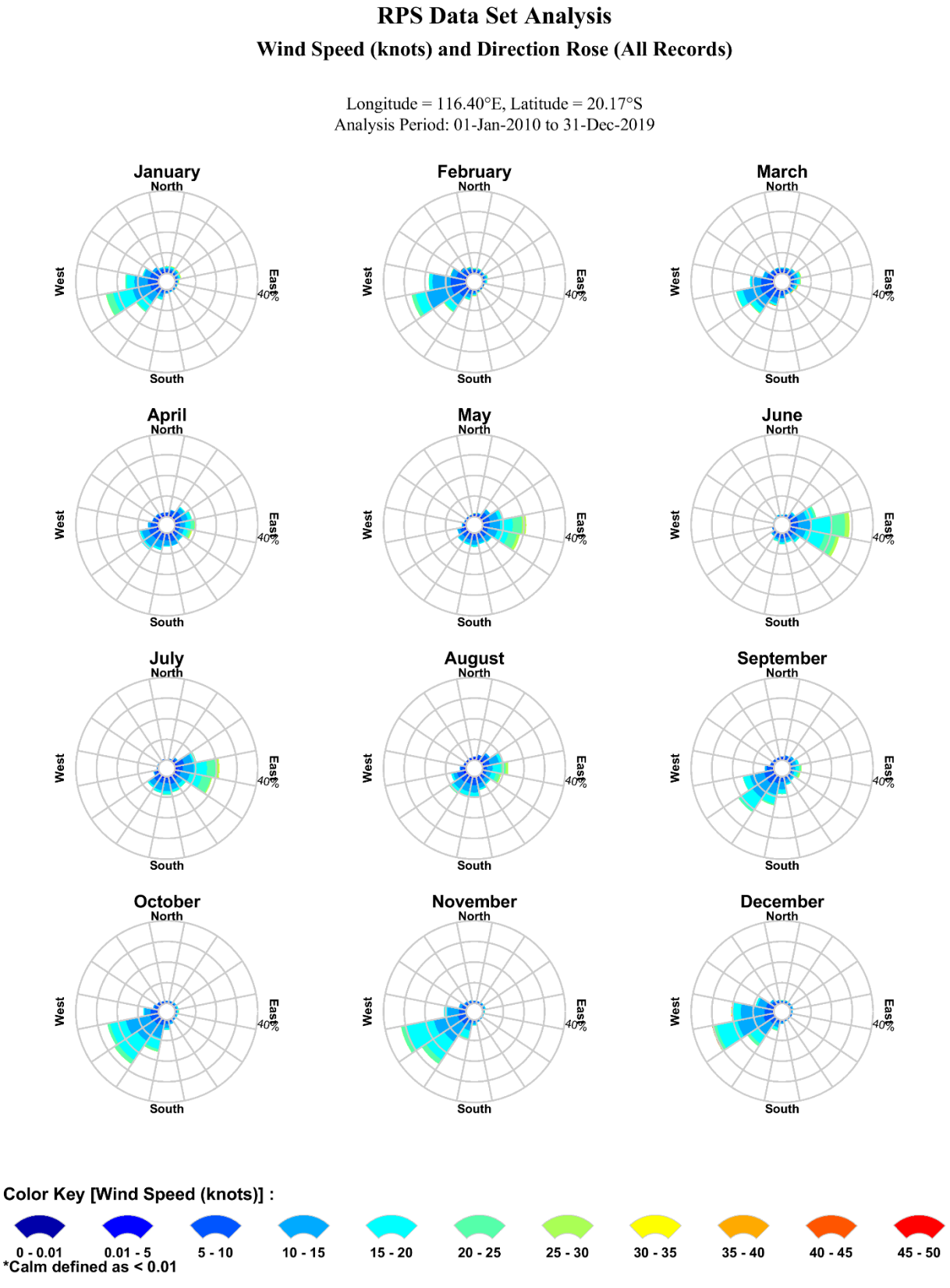

Figure 4.2 Monthly wind rose plots adjacent to the release location, derived from the 2010 to 2019 modelled dataset.

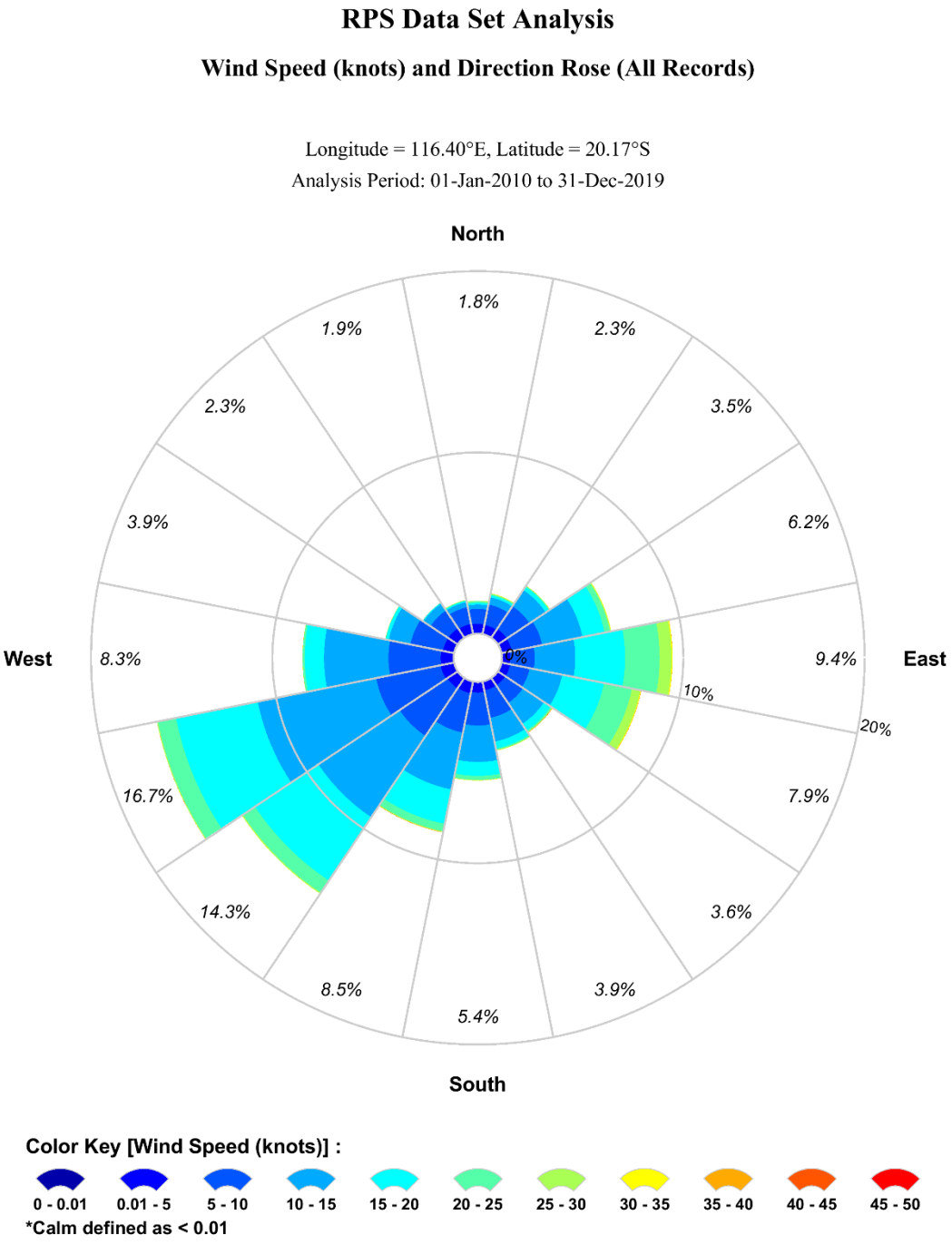

Figure 4.3 Total wind rose plot adjacent to the release location, derived from the 2010 to 2019 modelled dataset.

5 WATER TEMPERATURE AND SALINITY

The monthly depth-varying water temperature and salinity profiles for the closest point to the release location were obtained from the World Ocean Atlas 2018 database produced by the National Oceanographic Data Centre (National Oceanic and Atmospheric Administration) and its co-located World Data Center for Oceanography (Levitus et al., 2013). The data are used to inform the weathering, movement and evaporative loss of hydrocarbon spills in the surface and subsurface layers.

Table 5.1 shows that the monthly average sea surface (0-2 m depth layer) temperatures ranged from 24.0°C (September) to 29.6°C (March). Salinity remained consistent throughout the year ranging between 35.2 ppt and 35.4 ppt.

Figure 5.1 presents monthly temperature and salinity profiles throughout the water column in the vicinity of the release location.

Table 5.1 Monthly average sea surface (0-2 m depth layer) temperature and salinity in the vicinity of the release location.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Temperature (°C)	27.5	27.5	29.6	28.2	28.1	26.4	24.7	24.3	24.0	25.8	26.8	27.8
Salinity (psu)	35.3	35.3	35.2	35.2	35.4	35.4	35.2	35.2	35.2	35.2	35.3	35.2

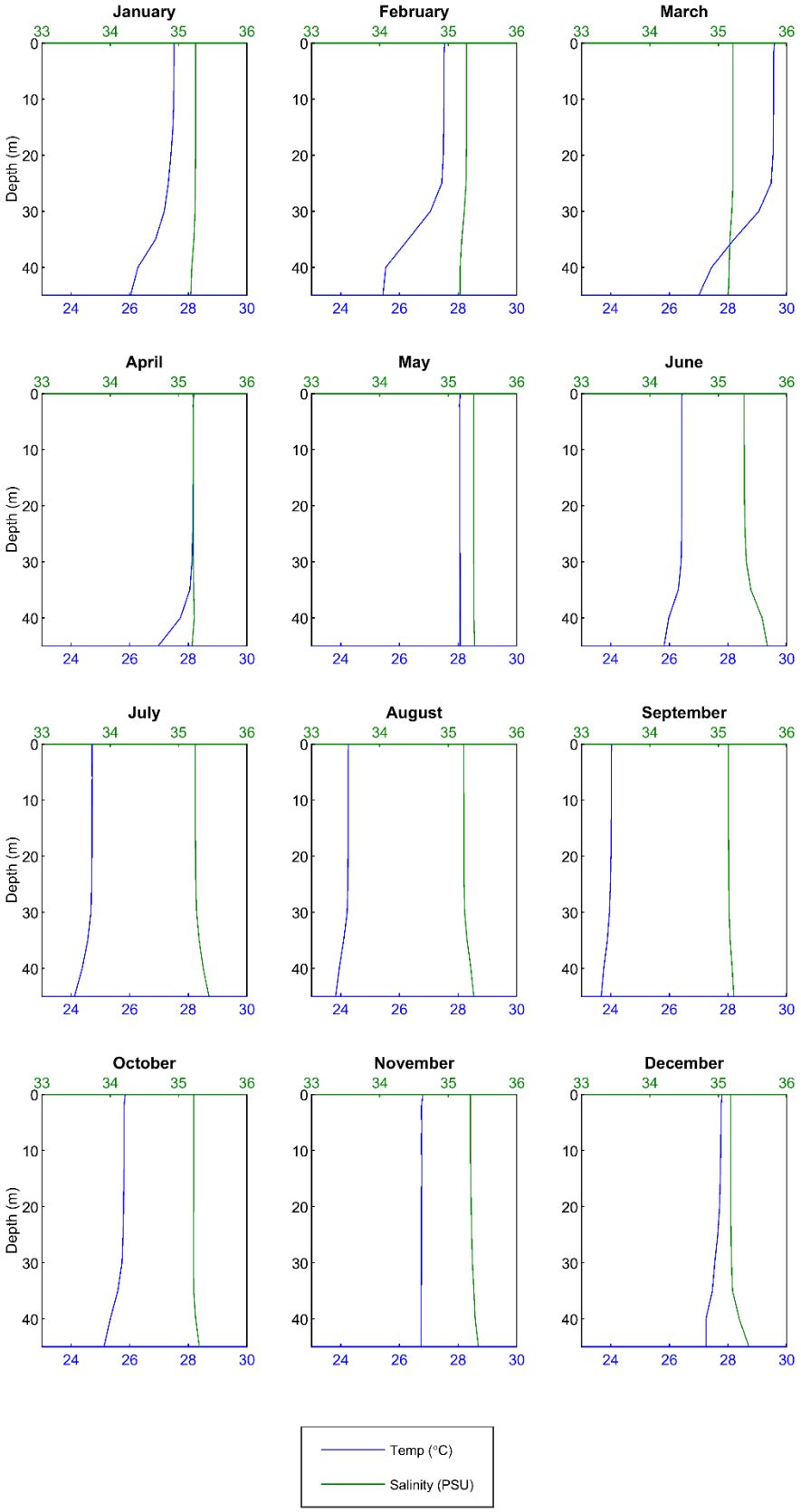

Figure 5.1 Monthly temperature and salinity profiles throughout the water column in the vicinity of the release location.

6 OIL SPILL MODEL SIMAP

The spill modelling was carried out using a purpose-developed oil spill trajectory and fates model, SIMAP (Spill Impact Model Application Package). This model is designed to simulate the transport and weathering processes that affect the outcomes of hydrocarbon spills to the sea, accounting for the specific oil type, spill scenario, and prevailing wind and current circulation patterns (French et al., 1999; French-McCay, 2003; 2004; French-McCay et al., 2004; 2021; 2022a; 2022b).

SIMAP is the evolution of the United States Environmental Protection Agency (US EPA) Natural Resource Damage Assessment model (French et al., 1999) and is designed to simulate the fate and effects of spilled oils and fuels for both the surface slick and the three-dimensional plume that is generated in the water column. SIMAP includes algorithms to account for both physical transport and weathering processes. The latter are important for accounting for the partitioning of the spilled mass over time between the water surface (surface slick), water column (entrained oil and dissolved compounds), atmosphere (evaporated compounds) and land (stranded oil). The model also accounts for the interaction between weathering and transport processes.

The physical algorithms calculate transport and spreading by physical forces, including surface tension, gravity as well as wind and current forces for both surface slicks and oil within the water column. The fates algorithms calculate all the weathering processes known to be important for oil spilled to marine waters. These include droplet and slick formation, entrainment by wave action, emulsification, dissolution of soluble components, sedimentation, evaporation, bacterial and photo-chemical decay and shoreline interactions. These algorithms account for the specific oil type being considered.

Entrainment is the physical process where globules of oil are transported from the sea surface into the water column by wind and wave-induced turbulence or be generated subsea by a pressurised discharge at depth. It has been observed that entrained oil is broken into droplets of varying sizes. Small droplets spread and diffuse into the water column, while larger ones rise rapidly back to the surface (Delvigne & Sweeney, 1988; Delvigne, 1991).

Dissolution is the process by which soluble hydrocarbons enter the water from a surface slick or from entrained droplets. The lower molecular weight hydrocarbons tend to be both more volatile and more soluble than those of higher molecular weight.

The formation of water-in-oil emulsions, or mousse, which is termed ‘emulsification’, depends on oil composition and sea state. Emulsified oil can contain as much as 80% water in the form of micrometre-sized droplets dispersed within a continuous phase of oil (Daling & Brandvik, 1991; Bobra, 1991; Daling et al., 1997; Fingas, 1995, Fingas & Fieldhouse, 2004).

Entrainment, dissolution and emulsification rates are correlated to wave energy, which is accounted for by estimating wave heights from the sustained wind speed, direction and fetch (i.e. distance downwind from land barriers) at different locations in the domain. Dissolution rates are dependent upon the proportion of soluble, short-chained hydrocarbon compounds, and the surface area at the oil/water interface of slicks. Dissolution rates are also strongly affected by the level of turbulence. For example, dissolution rates will be relatively high at the site of the release for a deep-sea discharge at high pressure.

Evaporation can result in the transfer of large proportions of spilled oil from the sea surface to the atmosphere, depending on the type of oil. Evaporation rates vary over space and time dependent on the prevailing sea temperatures, wind and current speeds, the surface area of the slick and entrained droplets that are exposed to the atmosphere as well as the state of weathering of the oil. Evaporation rates will decrease over time, depending on the calculated rate of loss of the more volatile compounds. By this process, the model can differentiate between the fates of different oil types.

Decay (degradation) of hydrocarbons may occur as the result of photolysis, which is a chemical process energised by ultraviolet light from the sun, and by biological breakdown, termed biodegradation. Many types of marine organisms ingest, metabolise and utilise oil as a carbon source, producing carbon dioxide and water as by-products.

The SIMAP weathering algorithms include terms to represent these dynamic processes. Technical descriptions of the algorithms used in SIMAP and validations against real spill events are provided in French et al., (1999) and French-McCay (2004).

Input specifications for oil types include density, viscosity, pour-point, distillation curve (volume of oil distilled off versus temperature) and the aromatic/aliphatic component ratios within given boiling point ranges. The model calculates a distribution of the oil by mass into the following components:

- Surface-bound or floating oil;
- Entrained oil (non-dissolved oil droplets that are physically entrained by wave action);
- Dissolved hydrocarbons (principally the aromatic and short-chained aliphatic compounds);
- Evaporated hydrocarbons;
- Sedimented hydrocarbons; and
- Decayed hydrocarbons.

7 THRESHOLDS

The SIMAP model will track oil concentrations to very low levels. Hence, it is useful to define meaningful threshold concentrations for the recording of contact by oil components and determining the probability of exposure at a location (calculated from the number of replicate simulations in which this contact occurred).

The judgement of meaningful levels is complicated and will depend upon the mode of action, sensitivity of the biota contacted, the duration of the contact and the toxicity of the compounds that are represented in the oil. The latter factor is further complicated by the change in the composition of an oil type over time due to weathering processes. Without specific testing of the oil types, at different states of weathering against a wide range of the potential local receptors, such considerations are beyond the scope of this investigation.

It is important to note that the thresholds herein are based on the thresholds outlined in the NOPSEMA Oil Spill Modelling Bulletin (NOPSEMA, 2019), which are summarised in Table 7.1. Their relationship to exposure for the sea surface, shoreline, and water column (entrained and dissolved hydrocarbons) are presented in Sections 7.1 to 7.3. Supporting justifications of the adopted thresholds applied during the study and additional context relating to the area of exposure are also provided.

Table 7.1 Summary of the thresholds applied in this study.

Floating Oil Concentration (g/m^2)	Shoreline Oil Accumulation (g/m^2)	Entrained Hydrocarbons Concentration (ppb)	Instantaneous Dissolved Hydrocarbons (ppb)
1	10	10	10
10	100	100	50
50	1,000		400

7.1 Floating Oil

Floating oil concentrations are relevant to describing the risks of oil coating emergent reefs, vegetation in the littoral zone and shoreline habitats, as well as the risk to wildlife found on the water surface, such as marine mammals, reptiles, and birds. Floating oil is also visible at relatively low concentrations (> ~0.05 g/m^2). Hence, the area affected by visible oil, which might trigger social or economic impacts, will be larger than the area where biological impacts might be expected.

The low threshold for floating oil exposure was set to 1 g/m^2, which equates approximately to an average thickness of 1 µm. It represents the practical limit of observing hydrocarbon sheens in the marine environment. This threshold is considered below levels which would cause environmental harm and is more indicative of the areas perceived to be affected due to its visibility on the sea-surface and potential to trigger temporary closures of areas (i.e., fishing grounds) as a precautionary measure.

Oil of this thickness is described as rainbow sheen in appearance, according to the Bonn Agreement Oil Appearance Code (Bonn Agreement, 2009; AMSA, 2014) (see Table 7.2). Figure 7.1 shows photographs highlighting the difference in appearance between a silvery sheen, rainbow sheen and metallic sheen.

Ecological impact has been estimated to occur at 10 g/m^2 (a film thickness of approximately 10 µm or 0.01 mm) (French et al.,1996; French-McCay 2009) as this level of fresh oiling has been observed to mortally impact some birds through adhesion of oil to their feathers, exposing them to secondary effects such as hypothermia. The appearance of oil at this average thickness has been described as a metallic sheen (Bonn Agreement, 2009). Concentrations above 10 g/m^2 are also considered the lower actionable threshold, where oil may be thick enough for containment and recovery as well as dispersant treatment (AMSA, 2023).

Oil concentrations on the sea surface of 25 g/m^2 (or greater) would be harmful for all birds that have landed in an oil film due to potential contamination of their feathers, with secondary effects such as loss of temperature regulation and ingestion of oil through preening (Scholten et al., 1996; Koops et al., 2004). The appearance of oil at this thickness is also described as metallic sheen (Bonn Agreement, 2009). For this study the high exposure threshold was set to 50 g/m^2 and above based on NOPSEMA (2019). This threshold can also be used to inform response planning. Table 7.3 is a summary of each threshold.

Table 7.2 The Bonn Agreement Oil Appearance Code.

Code	Description Appearance	Layer Thickness Interval (g/m^2 or µm)	Litres per km^2
1	Sheen (silvery/grey)	0.04 – 0.30	40 – 300
2	Rainbow	0.30 – 5.0	300 – 5,000
3	Metallic	5.0 – 50	5,000 – 50,000
4	Discontinuous True Oil Colour	50 – 200	50,000 – 200,000
5	Continuous True Oil Colour	≥ 200	≥ 200,000

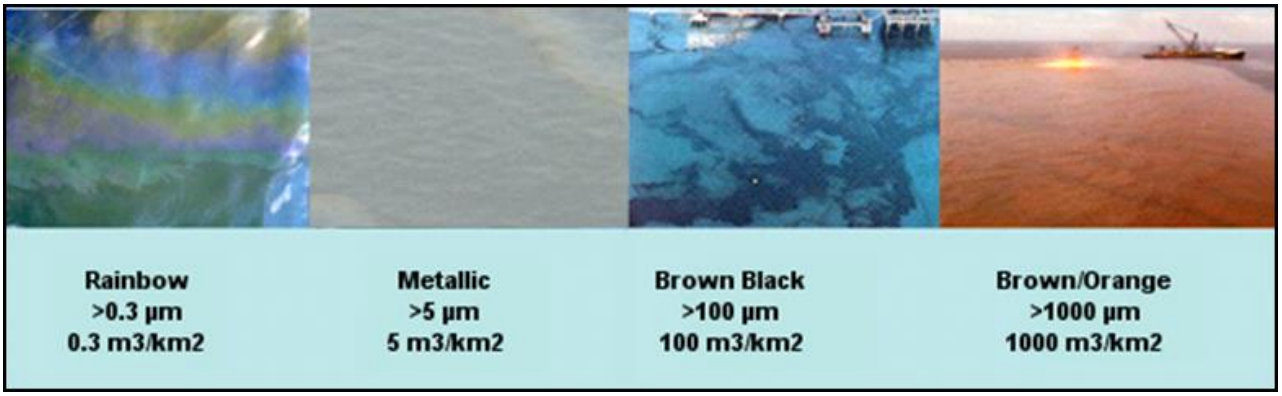

Figure 7.1 Photographs showing the difference between oil colour and thickness on the sea surface (source: adapted from Oil Spill Solutions, 2015).

Table 7.3 Floating oil exposure thresholds used in the oil spill modelling study (in alignment with NOPSEMA, 2019).

Threshold level	Floating oil (g/m^2)	Description
Low	1	Approximates range of socio-economic effects and establishes planning area for scientific monitoring
Moderate	10	Approximates lower limit for harmful exposures to birds and marine mammals
High	50*	Approximates surface oil slick and informs response planning

* 50 g/m^2 also used to define the threshold for actionable floating oil.

7.2 Shoreline Oil Accumulation

There are many different types of shorelines, ranging from cliffs, rocky beaches, sandy beaches, mud flats and mangroves, and each of these influences the volume of oil that can remain stranded ashore and its thickness before the shoreline saturation point occurs. For instance, a sandy beach may allow oil to percolate through the sand, thus increasing its ability to hold more oil ashore over tidal cycles and various wave actions than an equivalent area of water; hence oil can increase in thickness onshore over time. A sandy beach shoreline was assumed as the default shoreline type for the modelling in this study, as it allows for the highest carrying capacity of oil (of the available open/exposed shoreline types).

In, previous risk assessment studies, a threshold of 10 g/m^2 was used to assess the potential for shoreline accumulation (French-McCay et al.,2005a; 2005b). This is a conservative threshold used to define regions of socio-economic impact, such as triggering temporary closures of adjoining fisheries or the need for shore clean-up on beaches or man-made features/amenities (breakwaters, jetties, marinas, etc.). It would equate

to approximately 2 teaspoons of hydrocarbon per square meter of shoreline accumulation. The appearance is described as a stain/film. On that basis, the 10 g/m^2 has been selected to define the low threshold.

French et al. (1996) and French-McCay (2009) define a shoreline oil accumulation threshold of 100 g/m^2, or above, would potentially harm shorebirds and wildlife (fur-bearing aquatic mammals and marine reptiles on or along the shore) based on studies for sub-lethal and lethal impacts. This threshold has been used in previous environmental risk assessment studies (see French-McCay, 2003; French-McCay et al., 2004, French-McCay et al., 2011; 2012; NOAA, 2013). Additionally, this threshold is also recommended in AMSA's foreshore assessment guide as the acceptable minimum thickness that does not inhibit the potential for recovery and is best remediated by natural coastal processes alone (AMSA, 2023). This threshold equates to approximately ½ a cup of oil per square meter of shoreline accumulation and is described as a thin oil coat. The 100 g/m^2 has been selected to define the moderate threshold.

Observations by Lin & Mendelssohn (1996) demonstrated that loadings of more than 1,000 g/m^2 of hydrocarbon during the growing season would be required to impact marsh plants significantly. Similar thresholds have been found in studies assessing hydrocarbon impacts on mangroves (Grant et al., 1993; Suprayogi & Murray, 1999). This loading equates to approximately 1 litre of hydrocarbon per square meter of shoreline accumulation and the appearance is described as a hydrocarbon cover. A loading of 1,000 g/m^2 has been selected to define high threshold.

Table 7.4 is a summary of each threshold.

Table 7.4 Shoreline accumulation thresholds used in oil spill modelling study (in alignment with NOPSEMA, 2019).

Threshold level	Shoreline loading(g/m^2)	Description
Low	10	Predicts potential for some socio-economic impact
Moderate	100*	Loading predicts area likely to require clean-up effort
High	1,000	Loading predicts area likely to require intensive clean-up effort

* 100 g/m^2 also used to define the threshold for actionable shoreline oil.

7.3 In-water

Oil is a mixture of thousands of hydrocarbons of varying physical, chemical, and toxicological characteristics, and therefore, demonstrates varying fates and impacts on organisms. As such, for in-water exposure, the SIMAP model provides separate outputs for dissolved and entrained hydrocarbons from oil droplets. The consequences of exposure to dissolved and entrained components will differ because they have different modes and magnitudes of effect.

Entrained hydrocarbon concentrations were calculated based on oil droplets that are suspended in the water column, though not dissolved. The composition of this oil would vary with the state of weathering (oil age) and may contain soluble hydrocarbons when the oil is fresh. Calculations for dissolved hydrocarbons specifically calculates oil components which are dissolved in water, which are known to be the primary source of toxicity exerted by oil.

A complicating factor that should be considered when assessing the consequence of dissolved and entrained oil distributions is that there will be some areas where both physically entrained oil droplets and dissolved hydrocarbons co-exist. Higher concentrations of each will tend to occur close to the source where sea conditions can force mixing of relatively unweathered oil into the water column, resulting in more rapid dissolution of soluble compounds.

7.3.1 Dissolved Hydrocarbons

Laboratory studies have shown that dissolved hydrocarbons exert most of the toxic effects of oil on aquatic biota (Carls et al., 2008; Nordtug et al., 2011; Redman, 2015). The mode of action is a narcotic effect, which is positively related to the concentration of soluble hydrocarbons in the body tissues of organisms (French-McCay, 2002). Dissolved hydrocarbons are taken up by organisms directly from the water column by absorption through external surfaces and gills, as well as through the digestive tract. Thus, soluble hydrocarbons are termed “bioavailable”.

Hydrocarbon compounds vary in water-solubility and the toxicity exerted by individual compounds is inversely related to solubility, however bioavailability will be modified by the volatility of individual compounds (Nirmalakhandan & Speece, 1988; Blum & Speece, 1990; McCarty, 1986; McCarty et al., 1992a; 1992b; McCarty & Mackay, 1993; Verhaar et al., 1992; 1999; Swartz et al., 1995; French-McCay, 2002; McGrath & Di Toro, 2009). Of the soluble compounds, the greatest contributor to toxicity for water-column and benthic organisms are the lower-molecular-weight aromatic compounds, which are both volatile and soluble in water. Although they are not the most water-soluble hydrocarbons within most oil types, the polynuclear aromatic hydrocarbons (PAHs) containing 2 – 3 aromatic ring structures typically exert the largest narcotic effects because they are semi-soluble and not highly volatile, so they persist in the environment long enough for significant accumulation to occur (Anderson et al., 1974; 1987; Neff & Anderson, 1981; Malins & Hodgins, 1981; McAuliffe, 1987; NRC, 2003). The monoaromatic hydrocarbons (MAHs), including the BTEX compounds (benzene, toluene, ethylbenzene, and xylenes), and the soluble alkanes (straight chain hydrocarbons) also contribute to toxicity, but these compounds are highly volatile, so that their contribution will be low when oil is exposed to evaporation and higher when oil is discharged at depth where volatilisation does not occur (French-McCay, 2002).

French-McCay (2002) reviewed available toxicity data, where marine biota was exposed to dissolved hydrocarbons prepared from oil mixtures, finding that 95% of species and life stages exhibited 50% population mortality (LC_{50}) between 6 and 400 ppb (with an average of 50 ppb) total PAH concentration after 96 hrs exposure. Therefore, concentrations lower than 6 ppb total PAH value should be protective of 97.5% of species and life stages even with exposure periods of days (at least 96 hours). Early life-history stages of fish appear to be more sensitive than older fish stages and invertebrates.

Exceedances of 10, 50 or 400 ppb over a 1-hour timestep (see Table 7.5) were applied in this study to indicate the increasing potential for sub-lethal to lethal toxic effects (or low to high), based on NOPSEMA (2019).

7.3.2 Entrained Hydrocarbons

Entrained hydrocarbons consist of oil droplets that are suspended in the water column and insoluble. Insoluble compounds in oil cannot be absorbed from the water column by aquatic organisms, therefore they are not bioavailable through absorption of compounds from the water. Exposure to these compounds would require routes of uptake other than absorption of soluble compounds. The route of exposure of organisms to whole oil alone include direct contact with tissues of organisms and uptake of oil by direct consumption, with potential for biomagnification through the food chain (NRC, 2003).

Thresholds of 10 ppb and 100 ppb were applied over a 1-hour time exposure (Table 7.5) as per NOPSEMA (2019).

The 10-ppb threshold exposure zone is not considered to be of significant biological impact and is therefore outside the adverse exposure zone. This exposure zone represents the area contacted by the spill.

Table 7.5 Dissolved and entrained hydrocarbon exposure thresholds assessed over a 1-hour time step used in the oil spill modelling study (in alignment NOPSEMA, 2019).

	Exposure level	In-water threshold (ppb)	Description
Dissolved hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	Moderate	50	Approximates potential toxic effects, particularly sublethal effects to sensitive species
	High	400	Approximates toxic effects including lethal effects to sensitive species
Entrained hydrocarbons	Low	10	Establishes planning area for scientific monitoring based on potential for exceedance of water quality triggers
	Moderate	100	As appropriate given oil characteristics for informing risk evaluation

7.4 Dispersion Coefficients and Mixed Layer Depth

A horizontal dispersion coefficient of 10 m^2/s was used to account for dispersive processes acting on the floating oil on the sea surface that are below the scale of resolution of the current data and is based on typical values for open waters (Okubo, 1971).

A vertical dispersion coefficient (*Dv)* of 91 cm^2/s was used to represent the turbulent mixing and diffusion processes in the wave-mixed layer in the upper water column. It is a site-specific value computed using the 50^{th} percentile wind speed of approximately 12 knots at the operational area derived from the 10-year dataset (at 10 m above the sea surface, W_{10}) based on French-McCay (2004).

The mixed layer depth corresponds to the top layer of the water column, where vertical mixing is strong enough to cause uniform temperature and salinity, and is influenced by factors such as wind, ocean currents and waves. The 50^{th} percentile value at the site was calculated using Copernicus' 10 years (2010 to 2019) monthly averaged mixed layer depth data and was found to be 20 m.

8 OIL PROPERTIES

Table 8.1 and Table 8.2 present the physical properties and boiling point ranges of Wandoo crude and MDO used for Scenario 1 and Scenario 2 modelling, respectively.

Wandoo crude has a density of 937.0 kg/m^3 at 16ºC (API of 19.4) and a low pour point of -24°C, which ensures that this crude will remain in a liquid state over the annual temperature range observed on the North West Shelf. It is also low in wax content, typical of a biodegraded oil.

Generally, <2% of the crude should evaporate within the first 12 hours (Boiling point (BP) < 180°C); a further 10.2% is expected to evaporate within the first 24 hours (180°C < BP < 265°C); and an additional 33.1% should evaporate over several weeks (265°C < BP < 380°C). Additionally, 55% (by mass) of the crude will not evaporate, decaying slowly over time. It is categorised as a Group IV (or persistent) oil according to oil classifications by AMSA (2023). The classification is based on the specific gravity of hydrocarbons in combination with relevant boiling point ranges.

The MDO has a density of 890.0 kg/m^3 at 15ºC (API of 27.5) and a low pour point of -9.0°C. The low viscosity (14.0 cP at 25ºC) indicates that this oil will spread quickly when released and will form a thin to low thickness film on the sea surface, increasing the rate of evaporation. Generally, about 4% of the MDO mass should evaporate within the first 12 hours (Boiling point (BP) < 180°C); a further 32.0% should evaporate within the first 24 hours (180°C < BP < 265°C); and an additional 54.0% should evaporate over several days (265°C < BP < 380°C). Approximately 10% (by mass) of MDO will not evaporate, though will decay slowly over time. It is categorised as a Group II oil (light-persistent) according to the AMSA (2023) classifications.

It's noteworthy that the heavier components of the Wandoo crude and MDO, specifically the low volatile and persistent (residual) portions (i.e., ~88% and 64%, respectively), will have a strong tendency to become entrained into the water column in the presence of winds speeds above 7 knots and in turn breaking waves, however, it can re-surface under calm conditions (less than 7 knots).

Table 8.1 Physical properties for Wandoo crude and MDO.

Properties	Wandoo Crude	MDO
Density (kg/m^3)	937 (at 16 °C)	890.0 (at 15 °C)
API	19.4	27.5
Dynamic viscosity (cP)	161 (at 25 °C)	14.0 (at 25 °C)
Pour point (°C)	-24	-9.0
Hydrocarbon property category	Group IV	Group II
Hydrocarbon property classification	Persistent	Light persistent

Table 8.2 Boiling point ranges for Wandoo crude and MDO.

Characteristic Oil Type	Volatiles (%)	Semi-volatiles (%)	Low Volatiles (%)	Residual (%)
Boiling point (°C)	< 180	180-265	265-380	> 380
	Non persistent			Persistent
Wandoo crude	1.7	10.2	33.1	55.0
MDO	4.0	32.0	54.0	10.0

8.1 Weathering Characteristics

8.1.1 Wandoo crude

A series of weathering tests were conducted to illustrate the potential behaviour following a 50 m^3 instantaneous surface release of Wandoo crude when exposed to:

- 5 knot (2.6 m/s) constant wind speed, 27°C water temperature and currents; and
- Variable wind speeds (1 – 12 m/s or 2 to 24 knots), 27°C water temperature and currents.

The first case is indicative of the potential weathering rates under calm conditions that would not generate entrainment, while the second case would be more representative of the moderate winds experienced over the region.

The mass balance forecast for the constant wind case (Figure 8.1) shows that 13.0% of the crude is predicted to evaporate within 24 hours. The remaining hydrocarbon on the water surface will weather at a slower rate and be subject to more gradual decay through biological and photochemical processes.

In the variable wind speeds test (Figure 8.2), characterised by stronger average winds and breaking waves, there is an increased entrainment of the crude into the water column. Approximately 24 hours into the spill, the forecast indicates that 3.2% of the crude will have evaporated, with additional 93.9% expected to have entrained. Hence, less than 1% of floating oil remains on the water surface 24 hours into the spill.

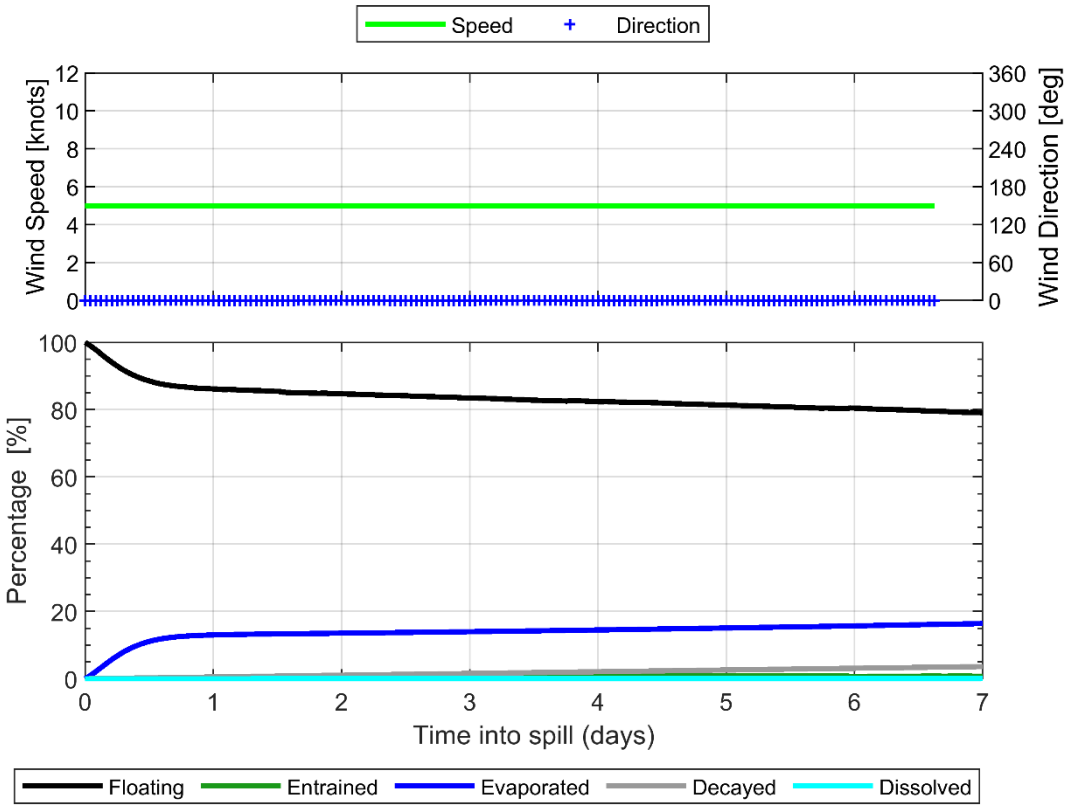

Figure 8.1 Mass balance plot for an instantaneous 50 m^3 surface release of Wandoo crude subjected to a constant 5 knot (2.6 m/s) wind, currents and 27°C water temperature.

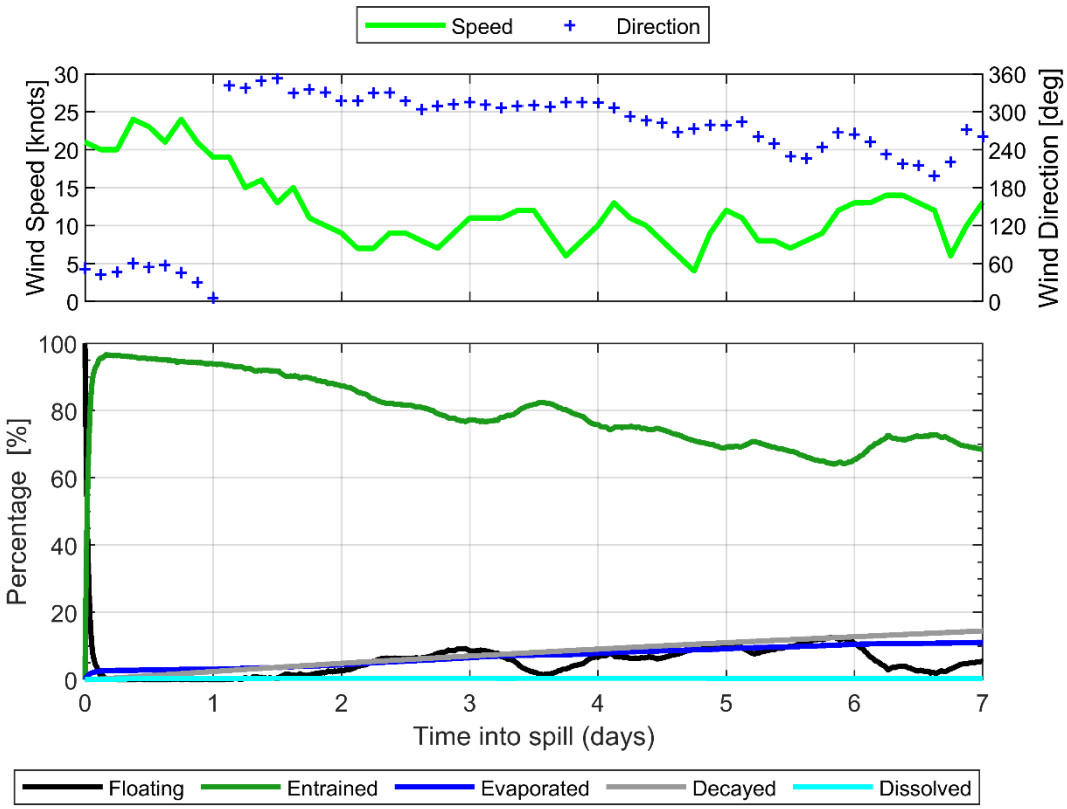

Figure 8.2 Mass balance plot for an instantaneous 50 m³ surface release of Wandoo crude subjected to variable wind speeds (1 – 12 m/s or 2 to 24 knots), currents and 27°C water temperature.

8.1.2 Marine Diesel Oil

A series of weathering tests were conducted to illustrate the potential behaviour following a 50 m³ instantaneous surface release of MDO when exposed to:

- 5 knot (2.6 m/s) constant wind speed, 27°C water temperature and currents; and
- Variable wind speeds (1 – 12 m/s or 2 to 23 knots), 27°C water temperature and currents.

The first case is indicative of the potential weathering rates under calm conditions that would not generate entrainment, while the second case would be more representative of the moderate winds experienced over the region.

The mass balance forecast for the constant wind case (Figure 8.1) shows that 36.1% of the MDO is predicted to evaporate within 24 hours. The remaining MDO on the water surface will weather at a slower rate and be subject to more gradual decay through biological and photochemical processes.

For the variable wind speed case (Figure 8.2), after 24 hours, 80.5% of the mass of MDO will have entrained, with an additional 15.0% expected to have evaporated. Hence, only a <1% of floating oil remains on the water surface. The low volatile and residual compounds are anticipated to entrain beneath the surface under conditions generating wind waves (winds approximately > 6 m/s). While the MDO is entrained, it is forecast to decay at a higher rate of 3% per day or 21% after 7 days, attributed to biological and photochemical degradation. This contrasts with a rate of 0.14% per day and a total of ~1% after 7 days for the constant-wind case. Given the proportion of entrained MDO and its tendency to remain mixed in the water column, the remaining hydrocarbons are expected to undergo decay over several weeks.

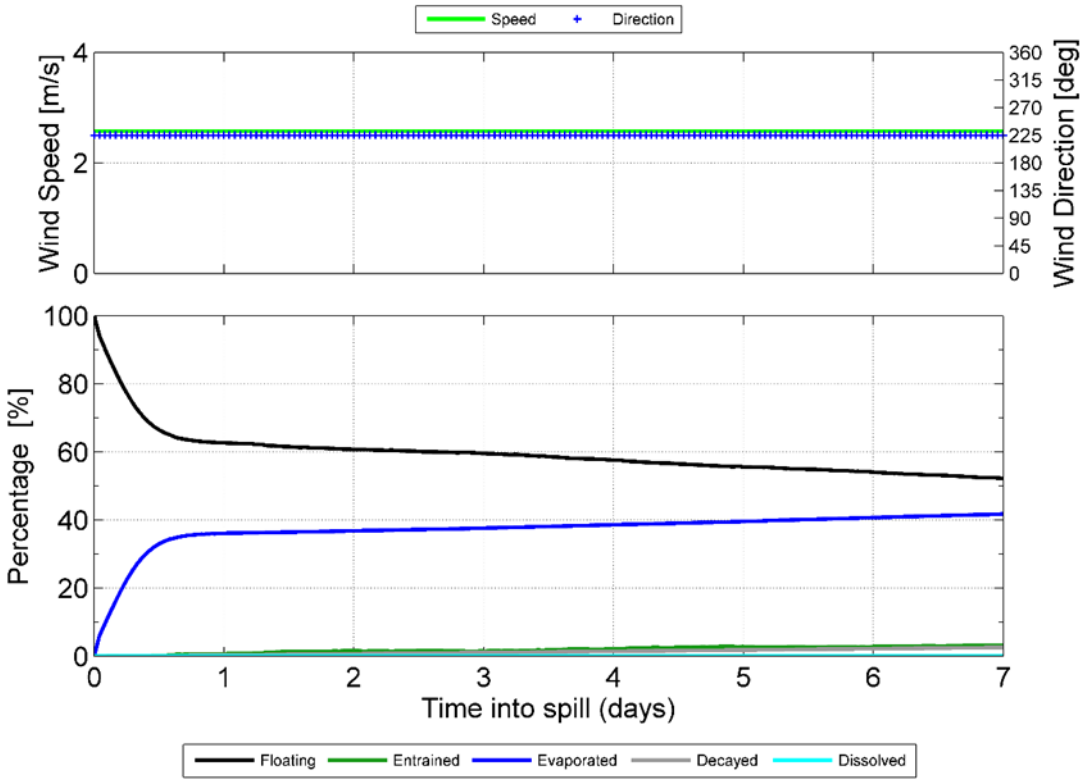

Figure 8.3 **Mass balance plot for an instantaneous 50 m^3 surface release of MDO subjected to a constant 5 knot (2.6 m/s) wind, currents and 27°C water temperature.**

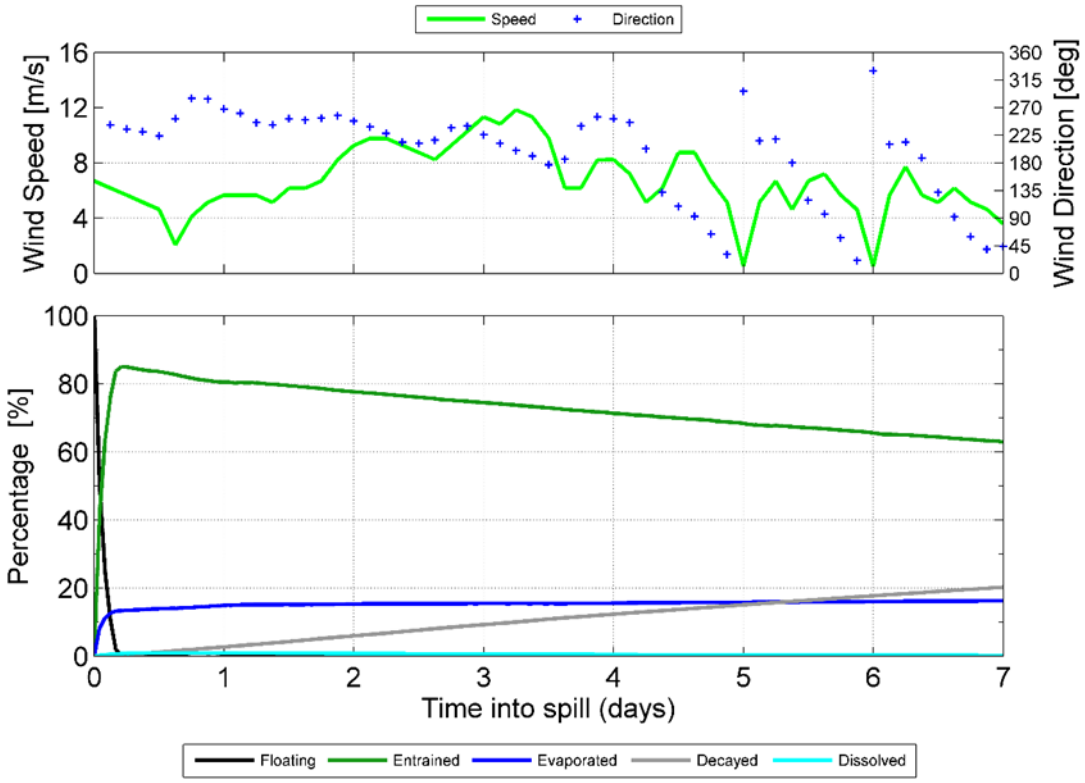

Figure 8.4 **Mass balance plot for an instantaneous 50 m^3 surface release of MDO subjected to variable wind speeds of 2 to 23 knots (1 – 12 m/s), currents and 27°C water temperature.**

9 RECEPTORS

A comprehensive receptor database was compiled from multiple sources to evaluate floating oil exposure, in-water column exposure (entrained and dissolved hydrocarbons), and shoreline oil accumulation. These sources include:

- Protected Matters Search Tool (PMST) from Department of Climate Change, Energy, the Environment and Water (https://pmst.awe.gov.au);
- Shoreline cells from the Western Australia Marine Oil Pollution Risk Assessment Protection Priorities (https://www.transport.wa.gov.au/imarine/preparedness-response-resources.asp); and
- Additional receptors, such as Habitat Critical to Turtles from Department of Climate Change, Energy, the Environment and Water (https://fed.dcceew.gov.au).

Table 9.1 summarises the receptors assessed for hydrocarbon exposure and presented in the report. Key receptor categories are presented in Figure 9.1 to Figure 9.19. Exposure risks were calculated separately for each receptor, and results are presented only for those receptors predicted to be exposed at, or above, the minimum thresholds. Additionally, exposure within Western Australian State Waters (WA State Waters) and Northern Territory Waters (NT Waters) was included as part of the study.

Table 9.1 Summary of receptors assessed for floating oil exposure, in-water column exposure (entrained and dissolved hydrocarbons), and shoreline oil accumulation. Results for these receptors have been presented.

Receptor Category	Acronym	Source	Hydrocarbon Exposure Assessment		
			Water Column	Floating oil	Shoreline
Australian Marine Park	AMP	https://pmst.awe.gov.au	✓	✓	×
Exclusive Economic Zone	EEZ	http://www.marineregions.org	✓	✓	×
Indigenous Protected Area	IPA	https://pmst.awe.gov.au	✓	✓	×
Key Ecological Feature	KEF	https://pmst.awe.gov.au	✓	✓	×
Management Agreement Area	MAA	https://pmst.awe.gov.au	✓	✓	×
Marine Park	MP	https://pmst.awe.gov.au	✓	✓	×
National Parks	NP	https://pmst.awe.gov.au	✓	✓	×
Nature Reserve	NR	https://pmst.awe.gov.au	✓	✓	×
Ramsar wetland	Ramsar	https://pmst.awe.gov.au	✓	✓	×
Reefs, Shoals and Banks	RSB	Digital nautical charts	✓	✓	×
State and Territory Waters	State and Territory Waters	https://www.ga.gov.au/scientific-topics/marine/jurisdiction	✓	✓	×
Western Australia Marine Oil Pollution Risk Assessment Protection Priorities (WAMOPRA)	Shoreline cells	http://www.transport.wa.gov.au	×	×	✓

Additionally, Table 9.2 lists other receptor categories that were assessed but not presented in the report for conciseness. However, these can be provided upon request if needed.

Table 9.2 Summary of receptors assessed for floating oil exposure, in-water column exposure (entrained and dissolved hydrocarbons), and shoreline oil accumulation. Results for these receptors have not been presented but can be provided upon request.

Receptor Category	Acronym	Source	Hydrocarbon Exposure Assessment		
			Water Column	Floating oil	Shoreline
5(1)(g) Reserve	S5G	https://pmst.awe.gov.au	✓	✓	×
5(1)(h) Reserve	S5H	https://pmst.awe.gov.au	✓	✓	×
Commonwealth Herritage Place Historic	CHPH	https://pmst.awe.gov.au	✓	✓	×
Commonwealth Herritage Place Natural	CHPN	https://pmst.awe.gov.au	✓	✓	×
Conservation Park	CP	https://pmst.awe.gov.au	✓	✓	×
Fish Habitat Protected Area	FHPA	https://pmst.awe.gov.au	✓	✓	×
Habitat Critical to Turtles	TUR	https://fed.dcceew.gov.au	✓	✓	×
Indigenous Cultural Heritage - WA	ICH	https://catalogue.data.wa.gov.au/dataset	✓	✓	×
Integrated Marine and Coastal Regionalisation of Australia (Meso-scale)	IMCRA	https://pmst.awe.gov.au	✓	✓	×
Nationally Important Wetlands	NIW	https://pmst.awe.gov.au	✓	✓	×
Shipwreck Protection Zones	SPZ	https://pmst.awe.gov.au	✓	✓	×
World Heritage Properties (Australia Only)	WHP	https://pmst.awe.gov.au	✓	✓	×

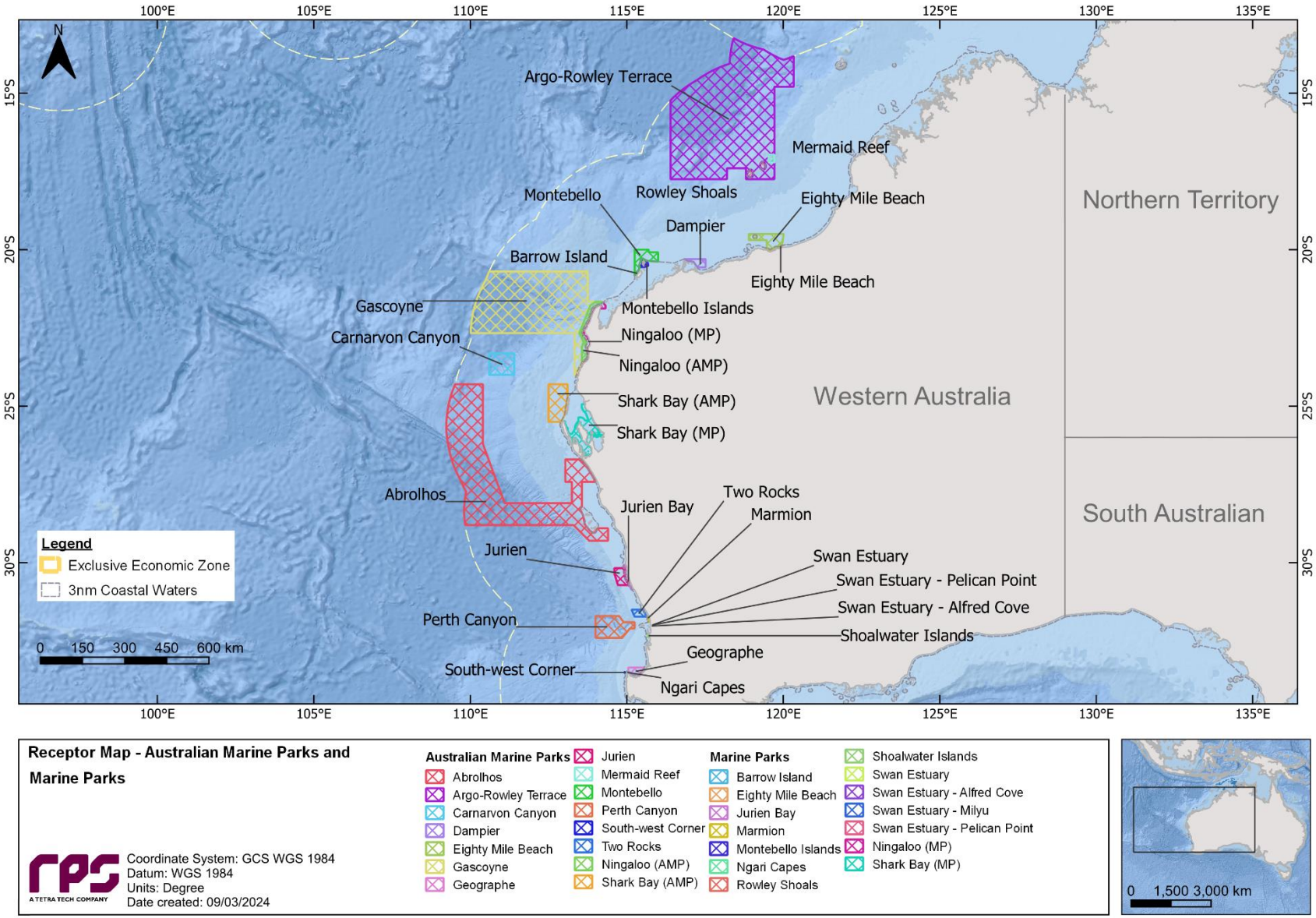

Figure 9.1 Receptor map for Australian Marine Parks and Marine Parks.

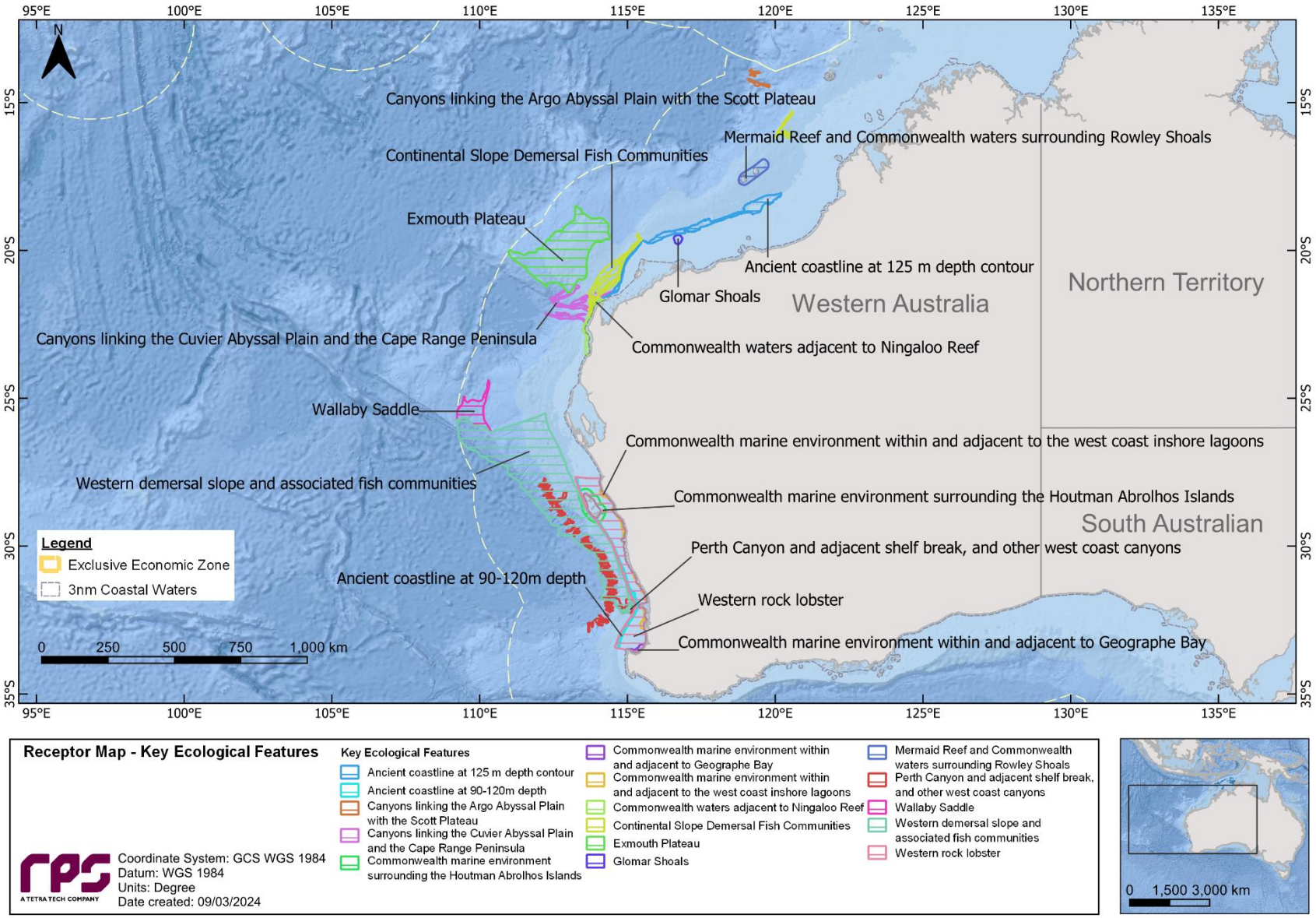

Figure 9.2 Receptor map of Key Ecological Features (KEF).

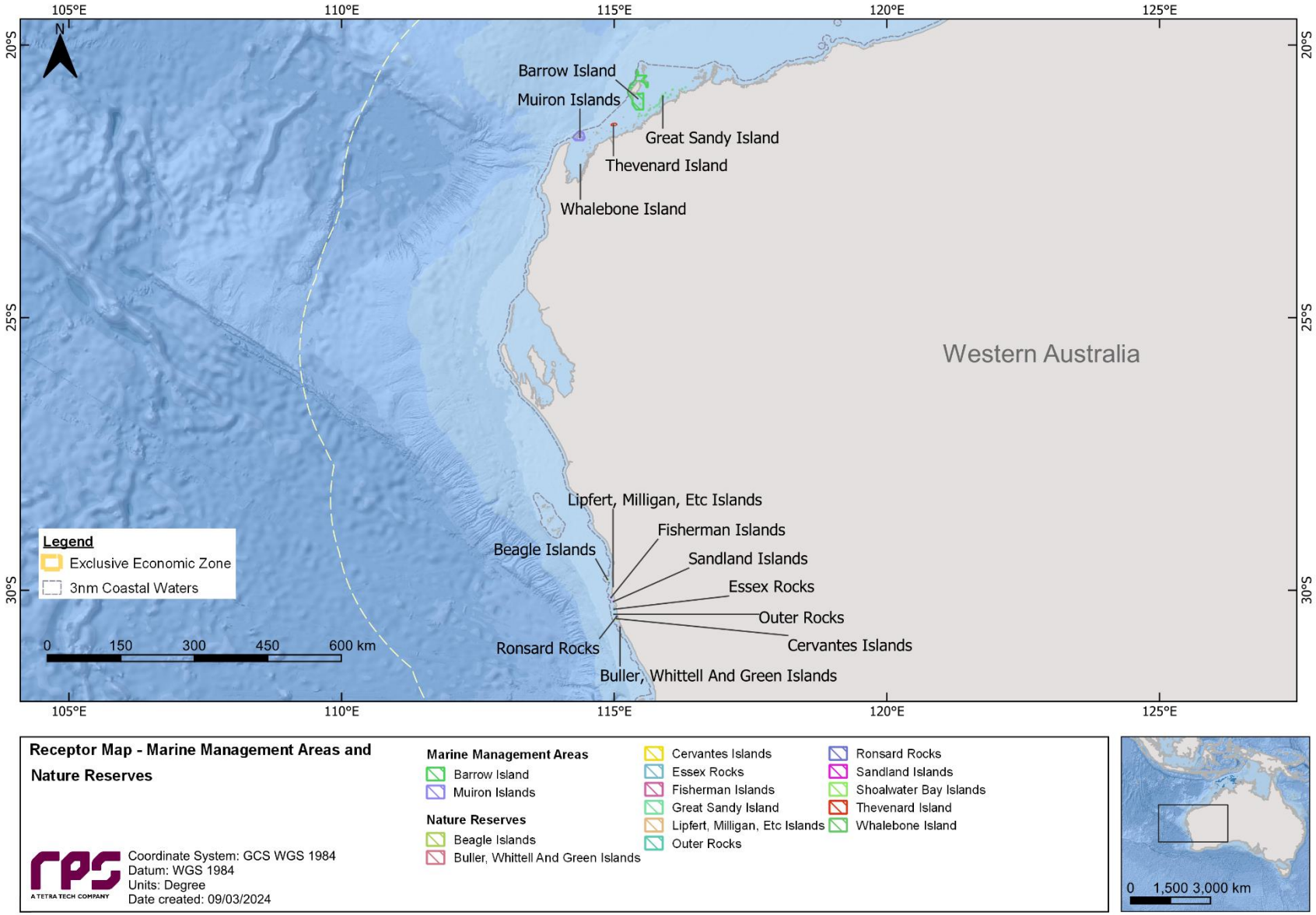

Figure 9.3 Receptor map of Marine Management Areas (MMA) and Nature Reserves (NR).

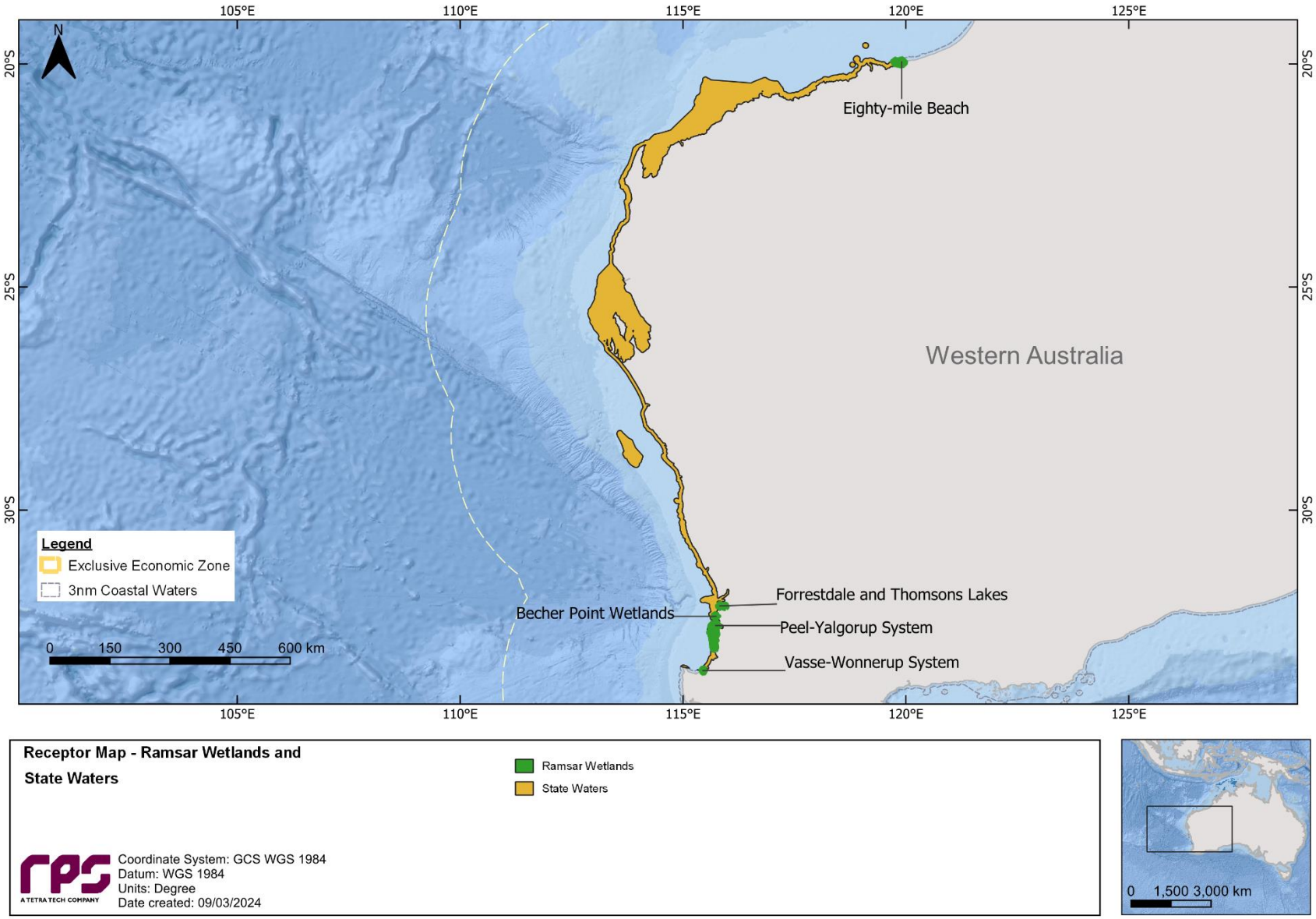

Figure 9.4 Receptor map for Ramsar wetlands and State and Territory Waters (1 of 2).

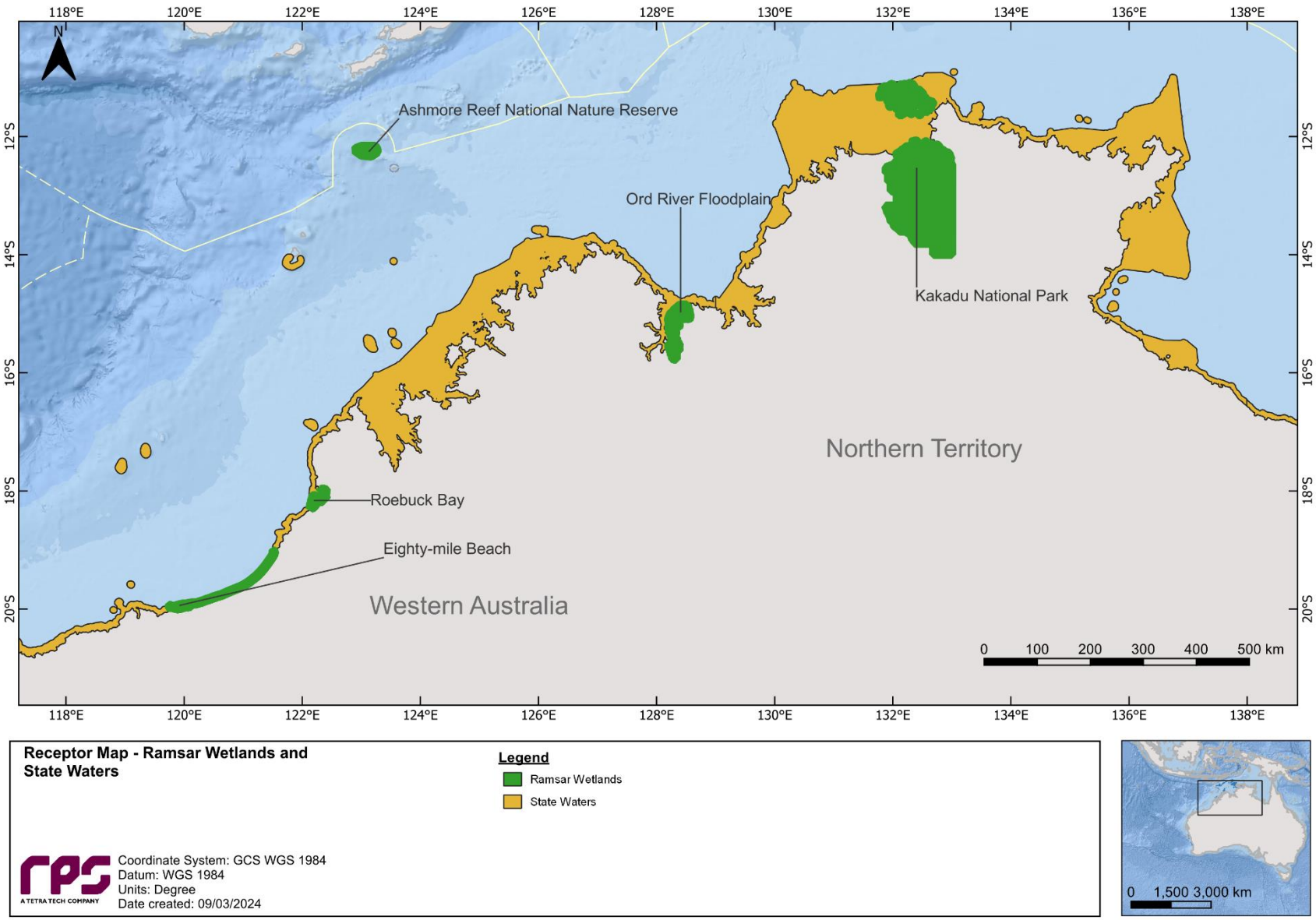

Figure 9.5 Receptor map for Ramsar wetlands and State and Territory Waters (2 of 2).

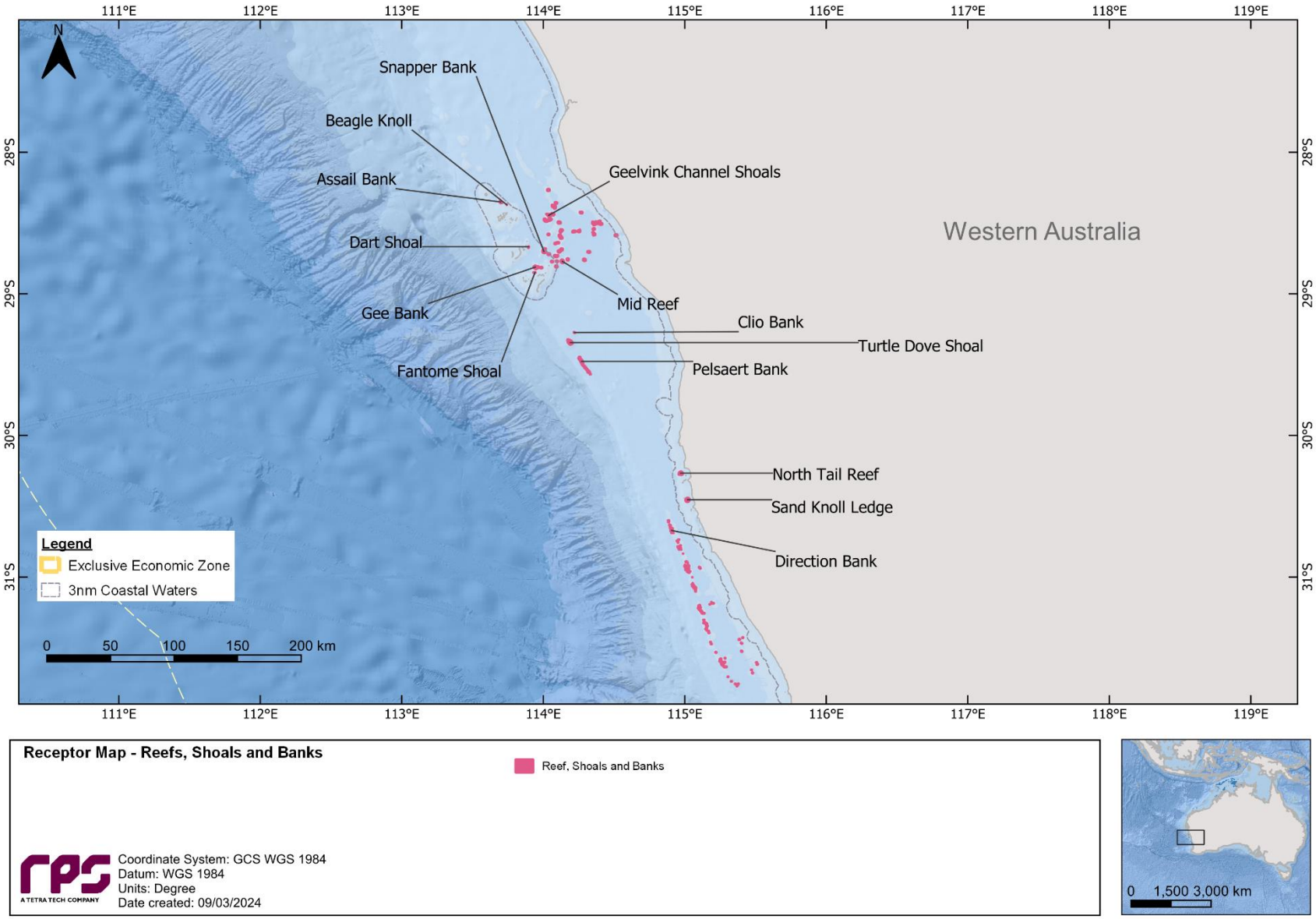

Figure 9.6 Receptor map for Reefs, Shoals and Banks (1 of 4)

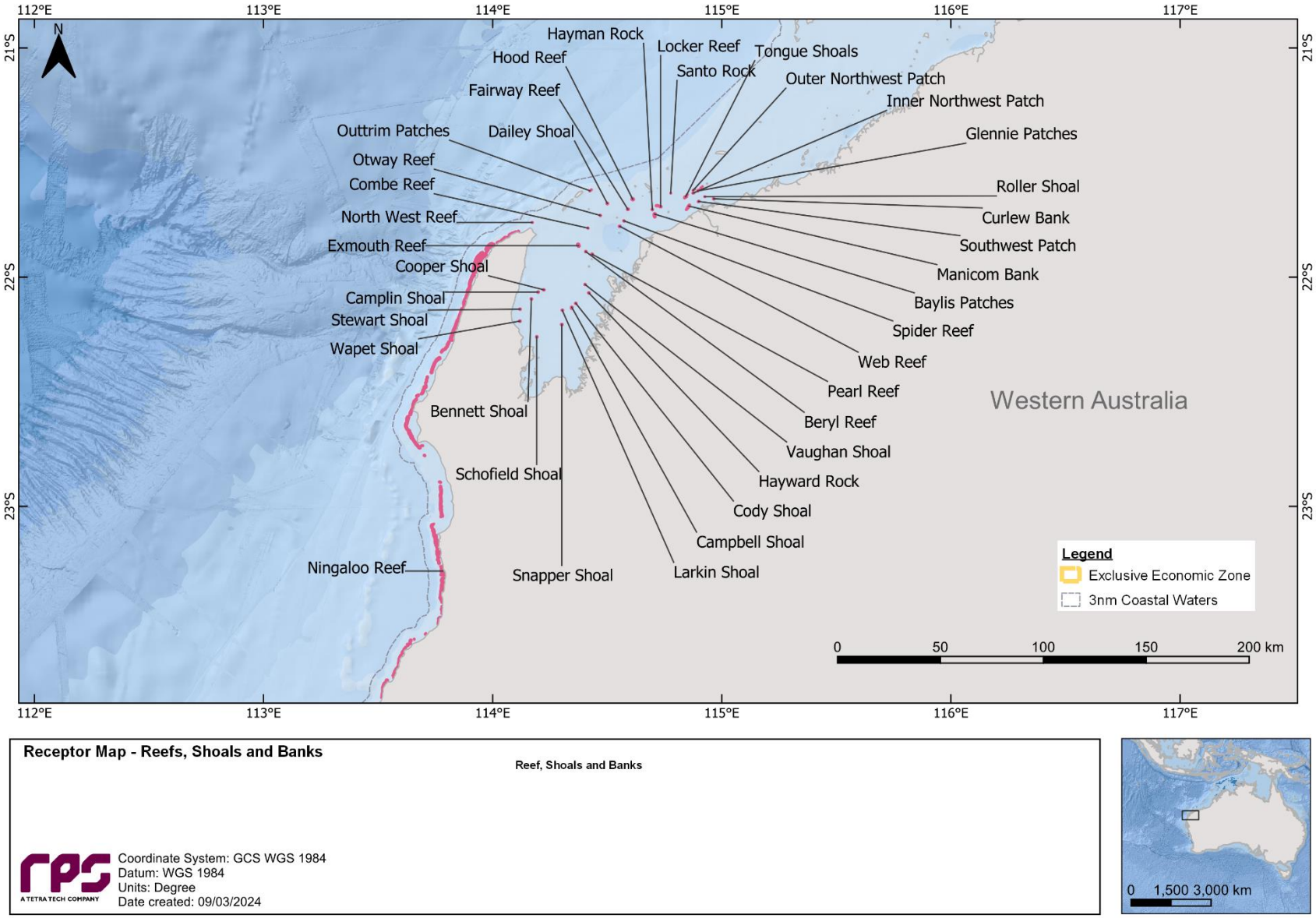

Figure 9.7 Receptor map for Reefs, Shoals and Banks (2 of 4)

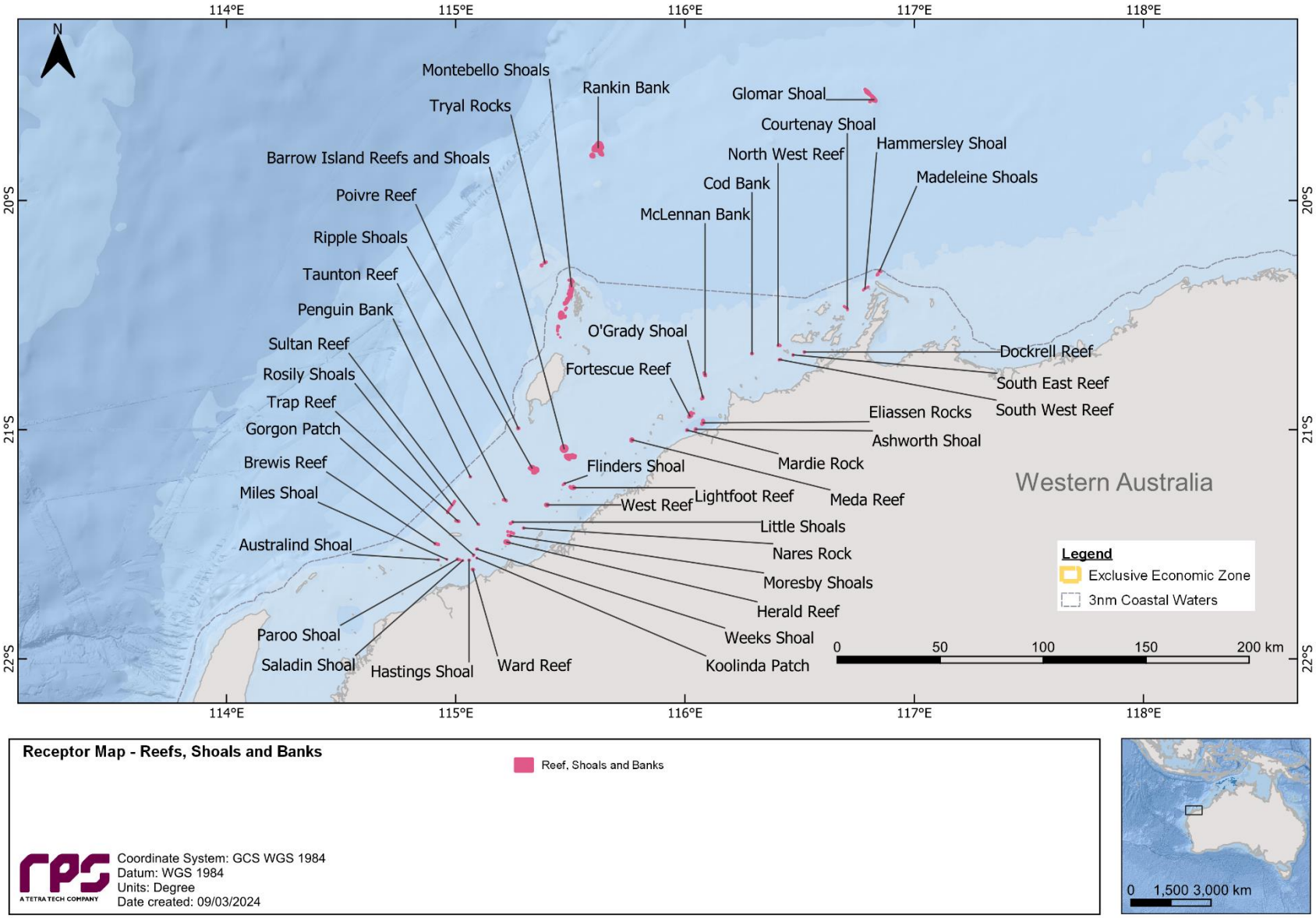

Figure 9.8 Receptor map for Reefs, Shoals and Banks (3 of 4)

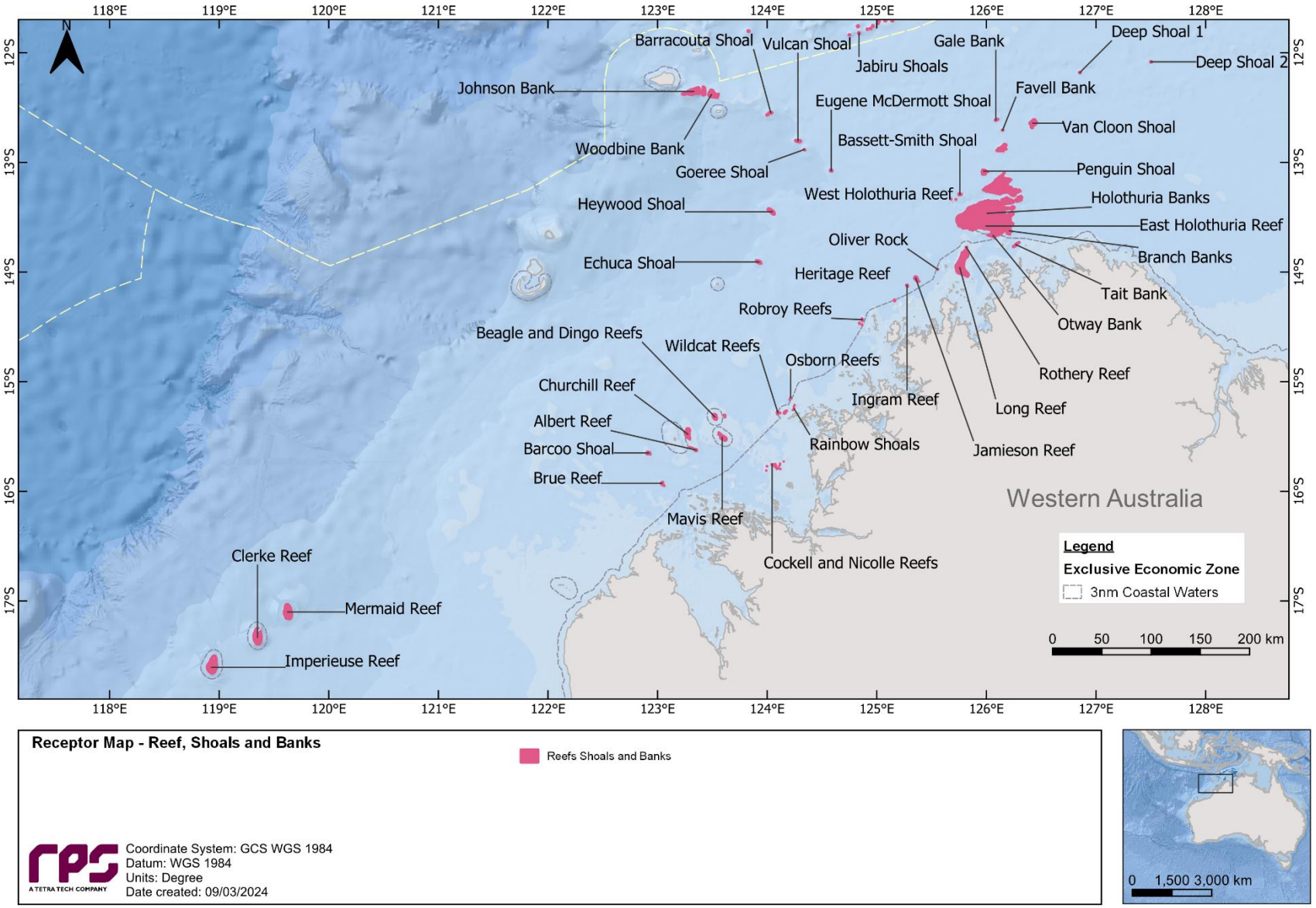

Figure 9.9 Receptor map for Reefs, Shoals and Banks (4 of 4)

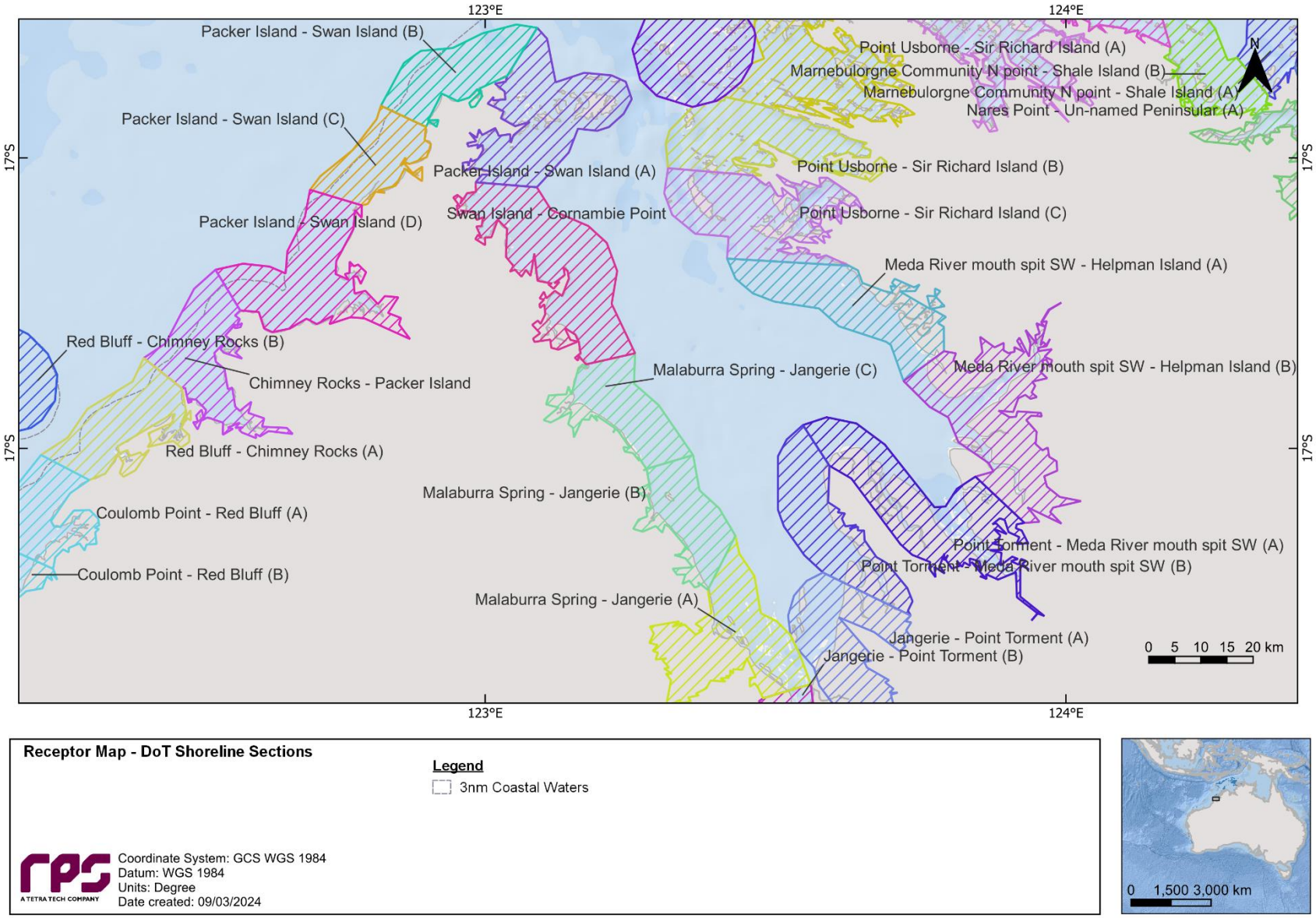

Figure 9.10 Receptor map for the WAMOPRA shoreline cells (1 of 10).

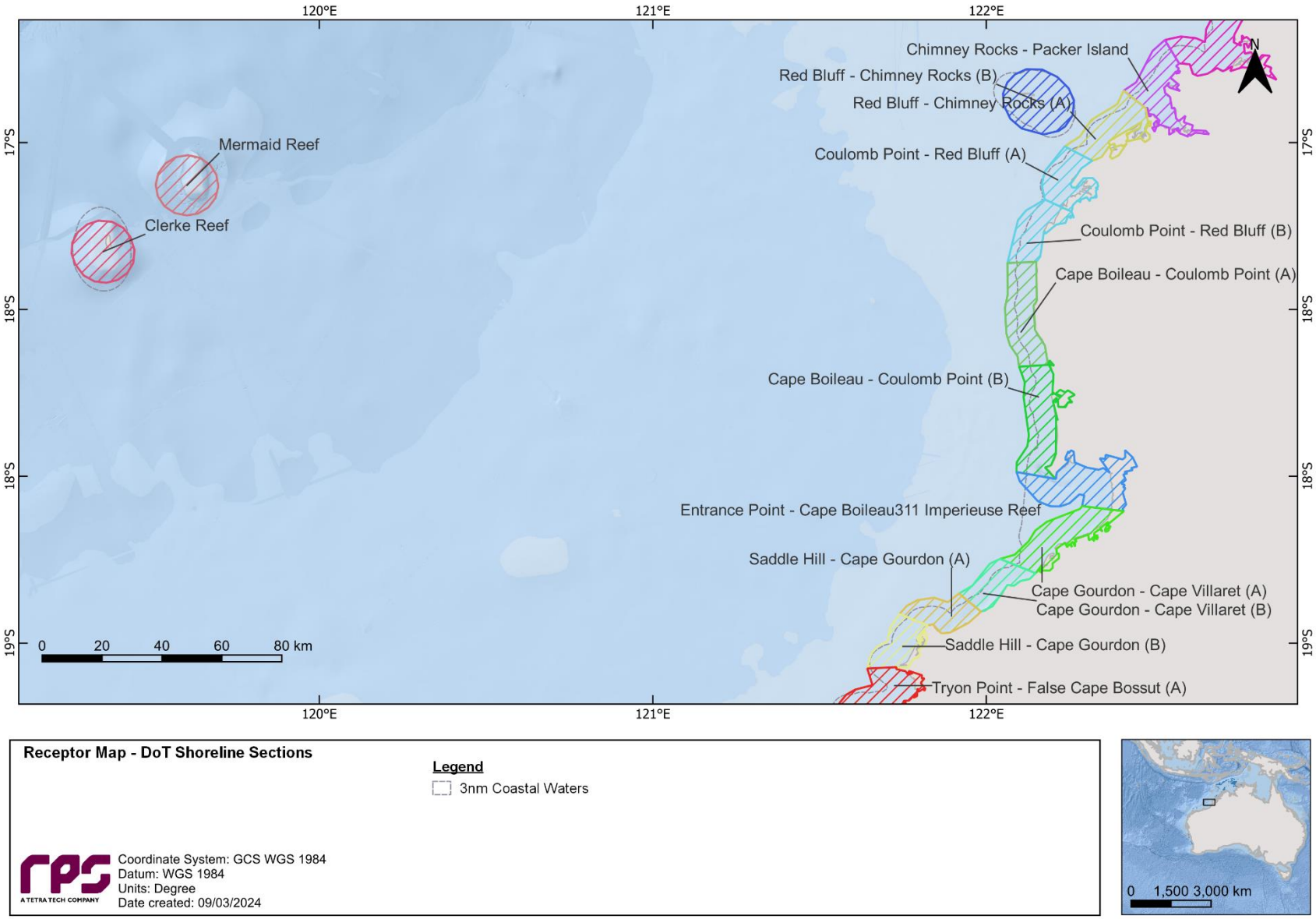

Figure 9.11 Receptor map for the WAMOPRA shoreline cells (2 of 10).

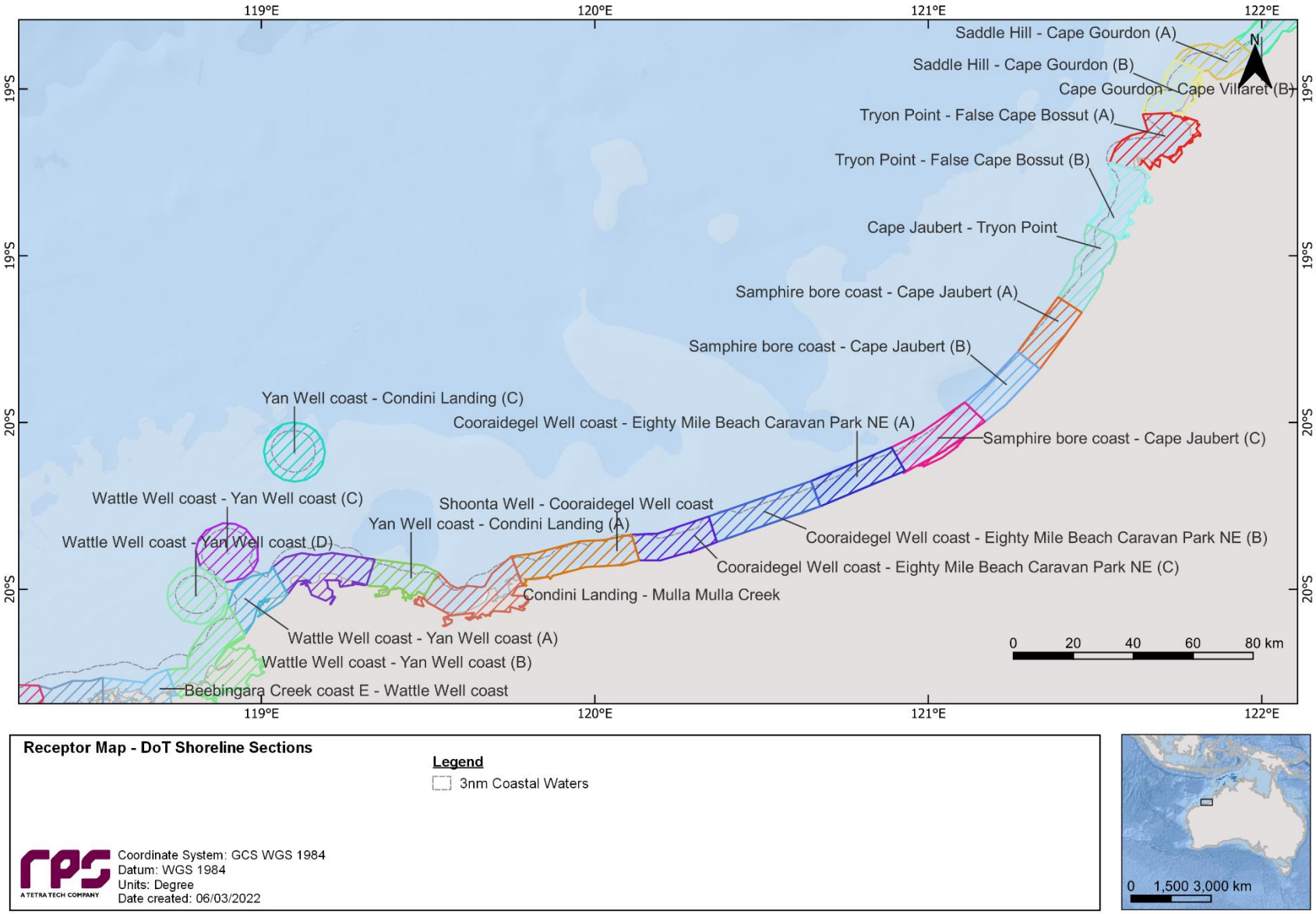

Figure 9.12 Receptor map for the WAMOPRA shoreline cells (3 of 10).

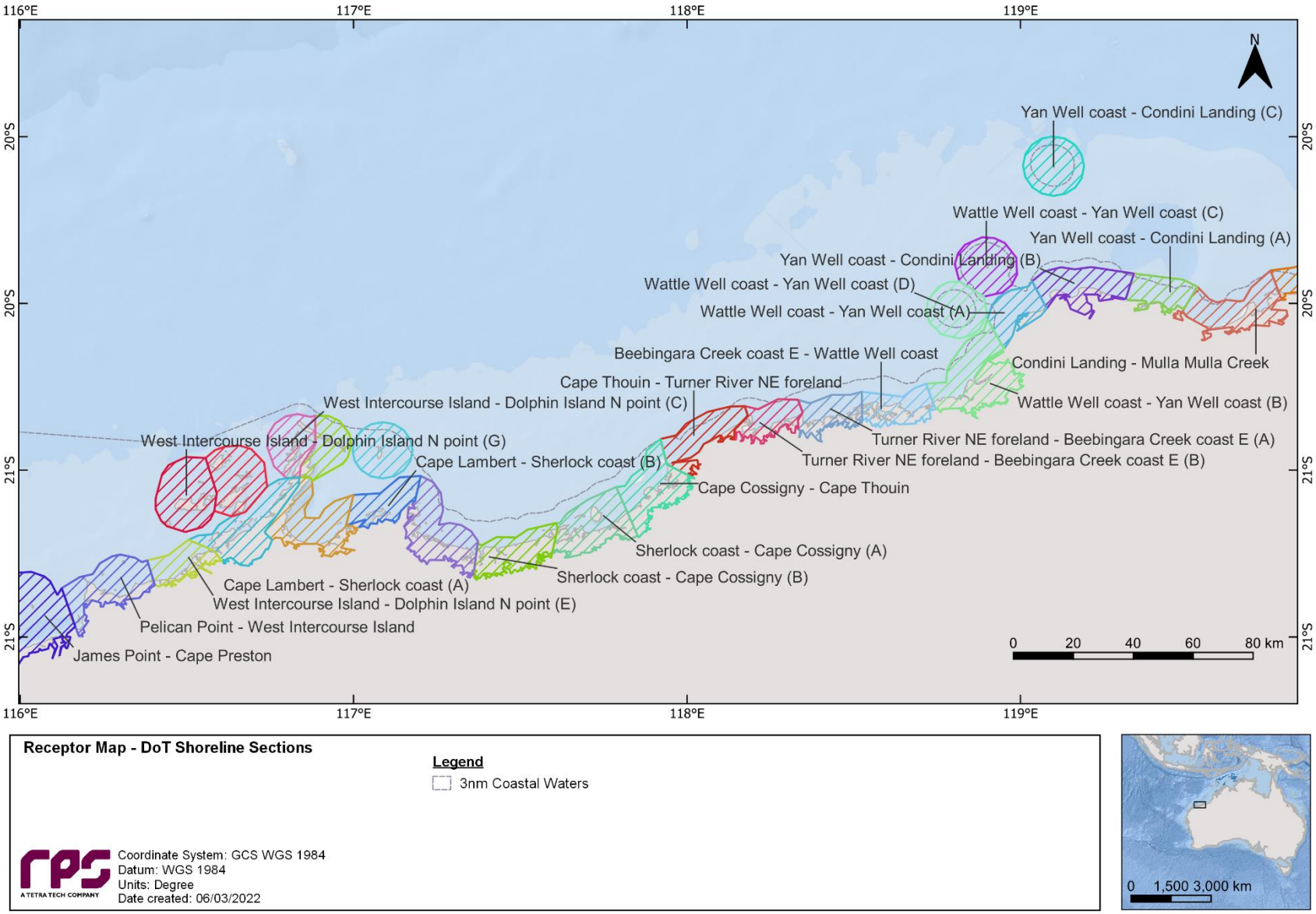

Figure 9.13 Receptor map for the WAMOPRA shoreline cells (4 of 10).

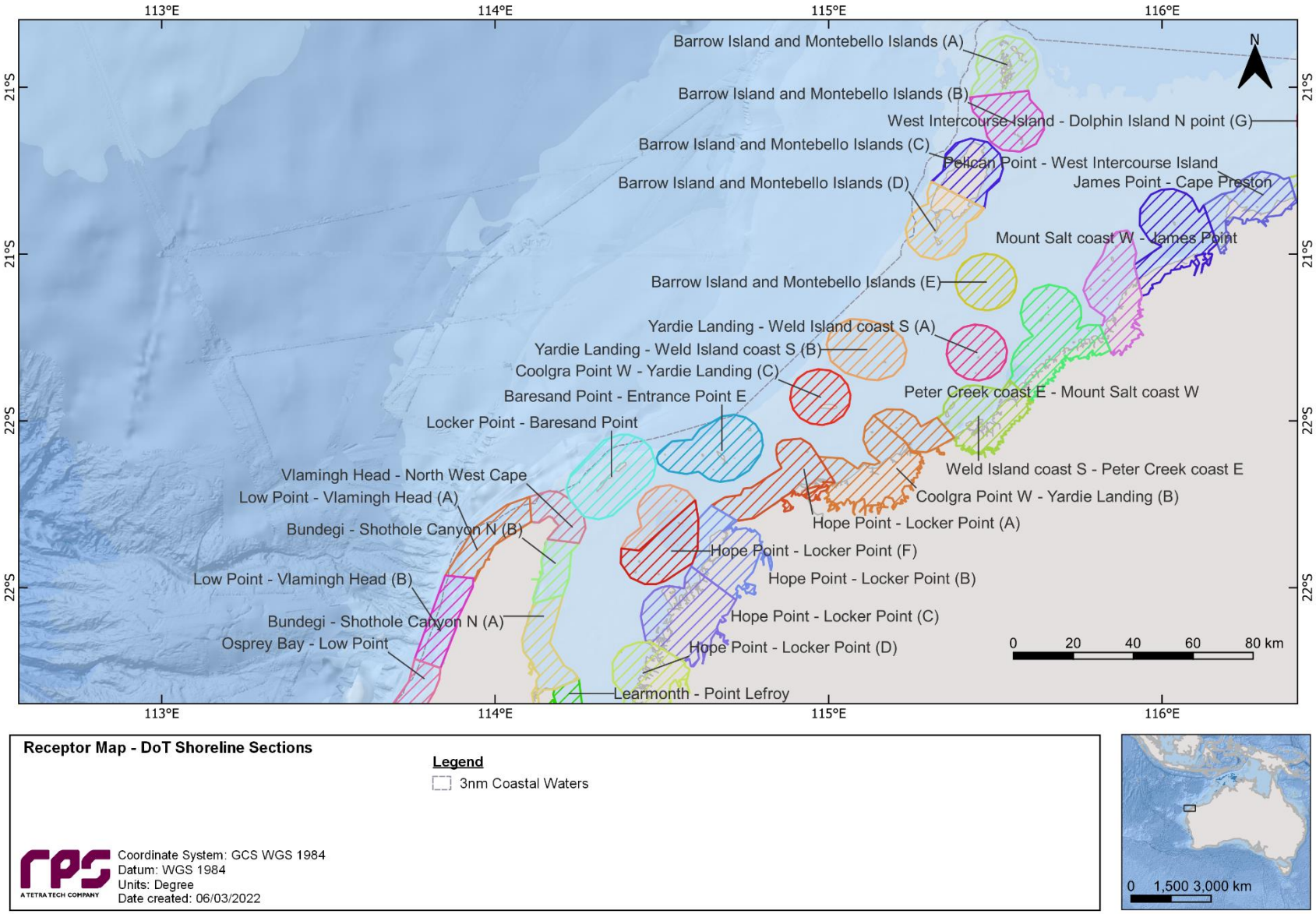

Figure 9.14 Receptor map for the WAMOPRA shoreline cells (5 of 10).

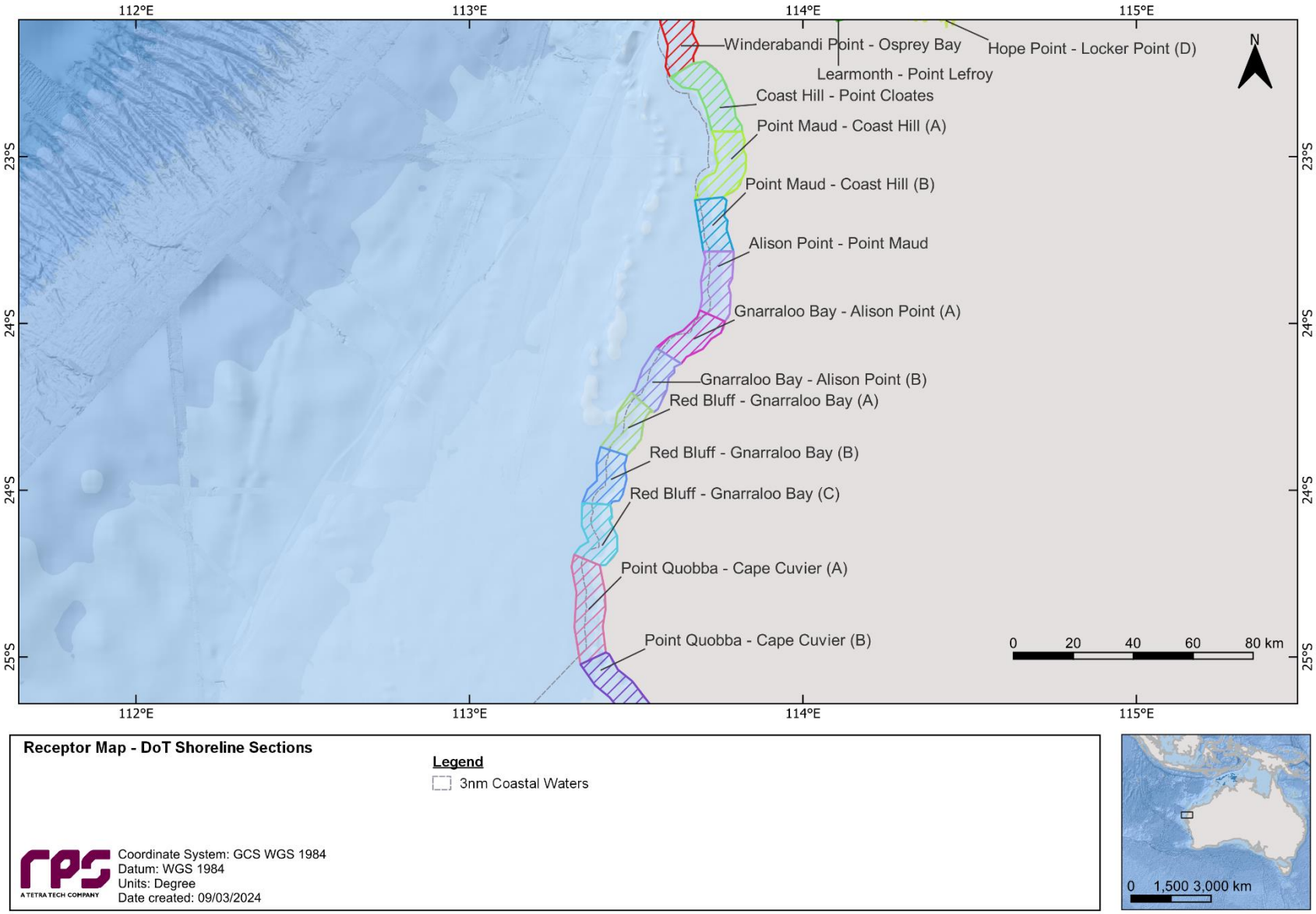

Figure 9.15 Receptor map for the WAMOPRA shoreline cells (6 of 10).

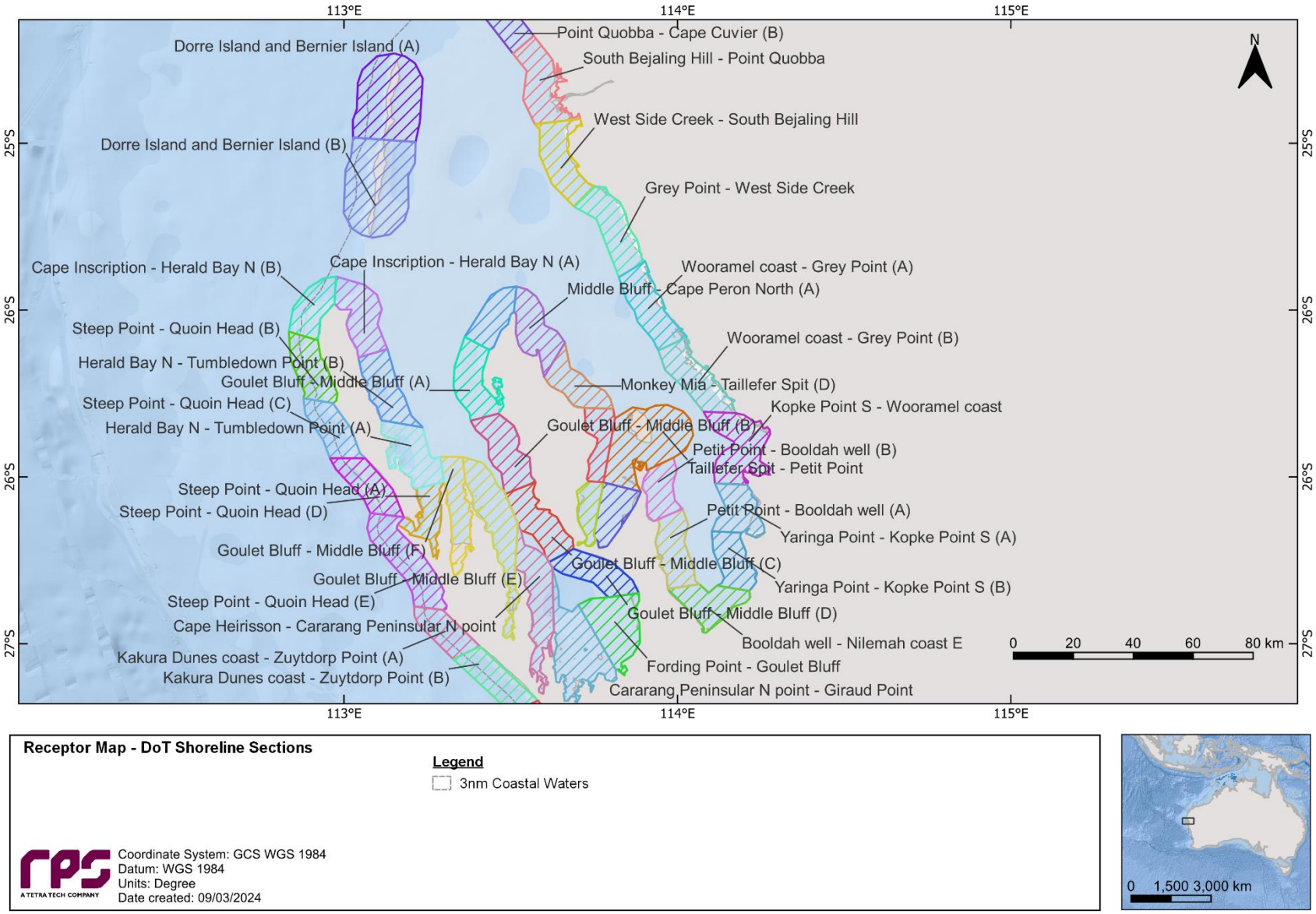

Figure 9.16 Receptor map for the WAMOPRA shoreline cells (7 of 10).

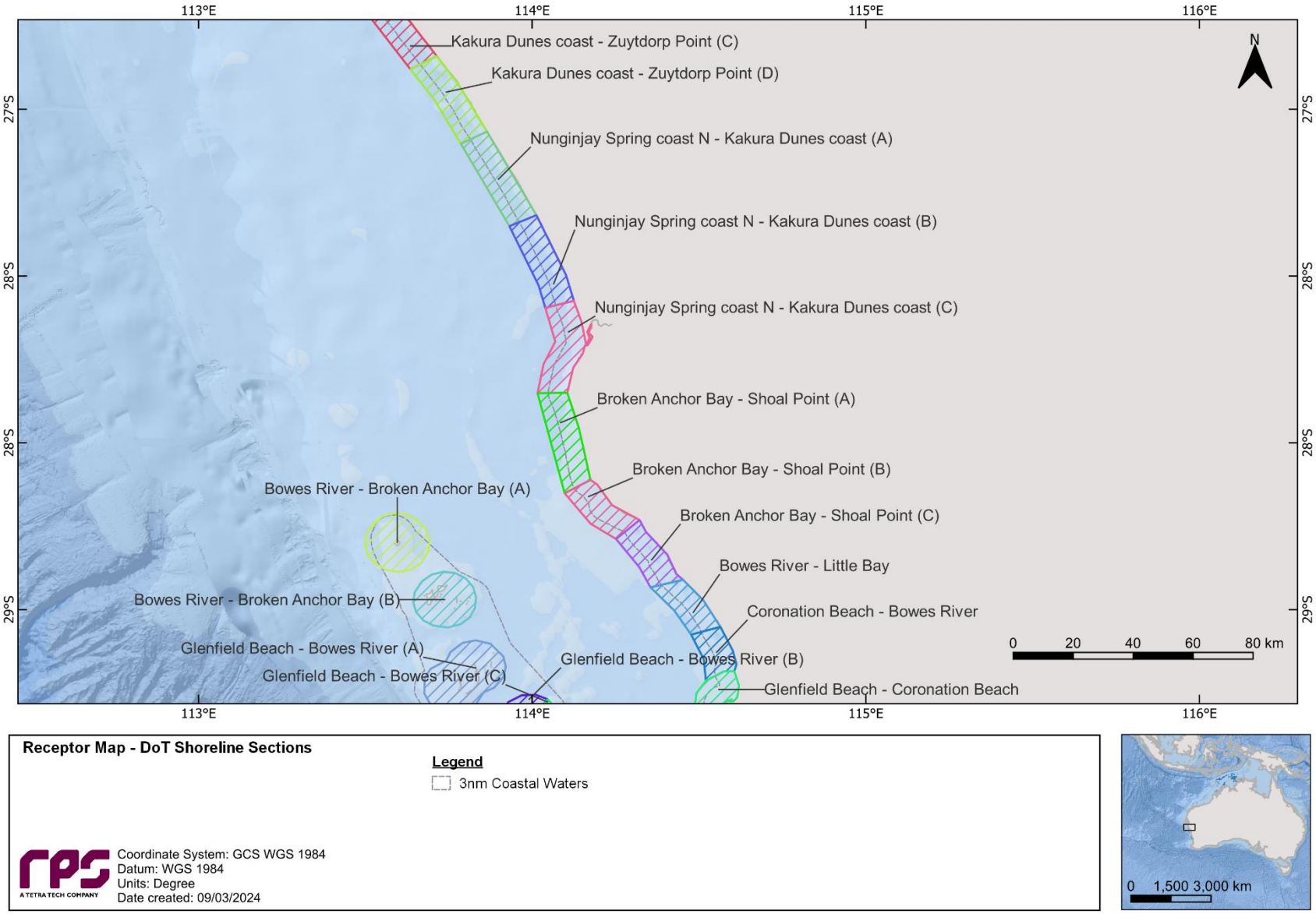

Figure 9.17 Receptor map for the WAMOPRA shoreline cells (8 of 10).

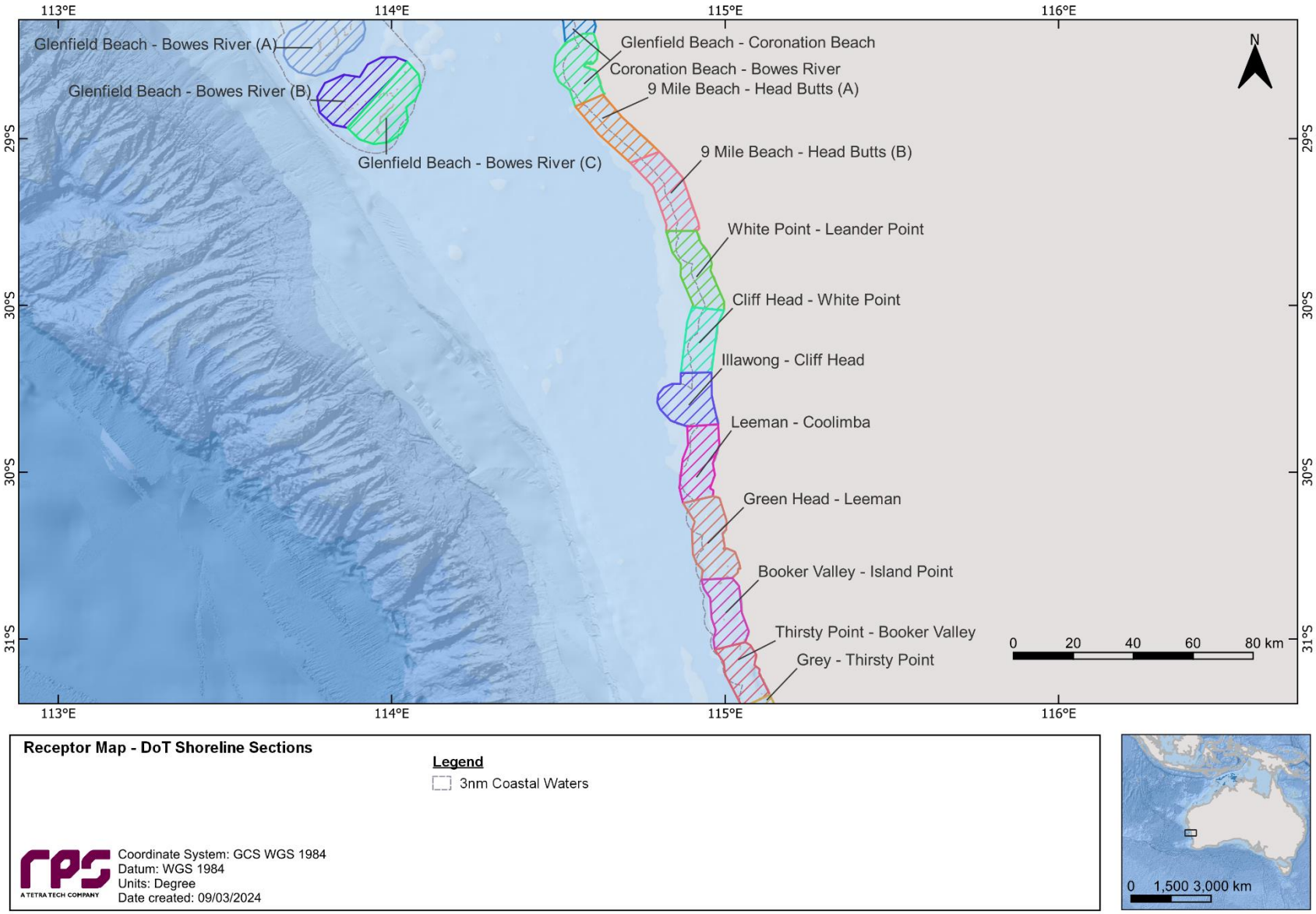

Figure 9.18 Receptor map for the WAMOPRA shoreline cells (9 of 10).

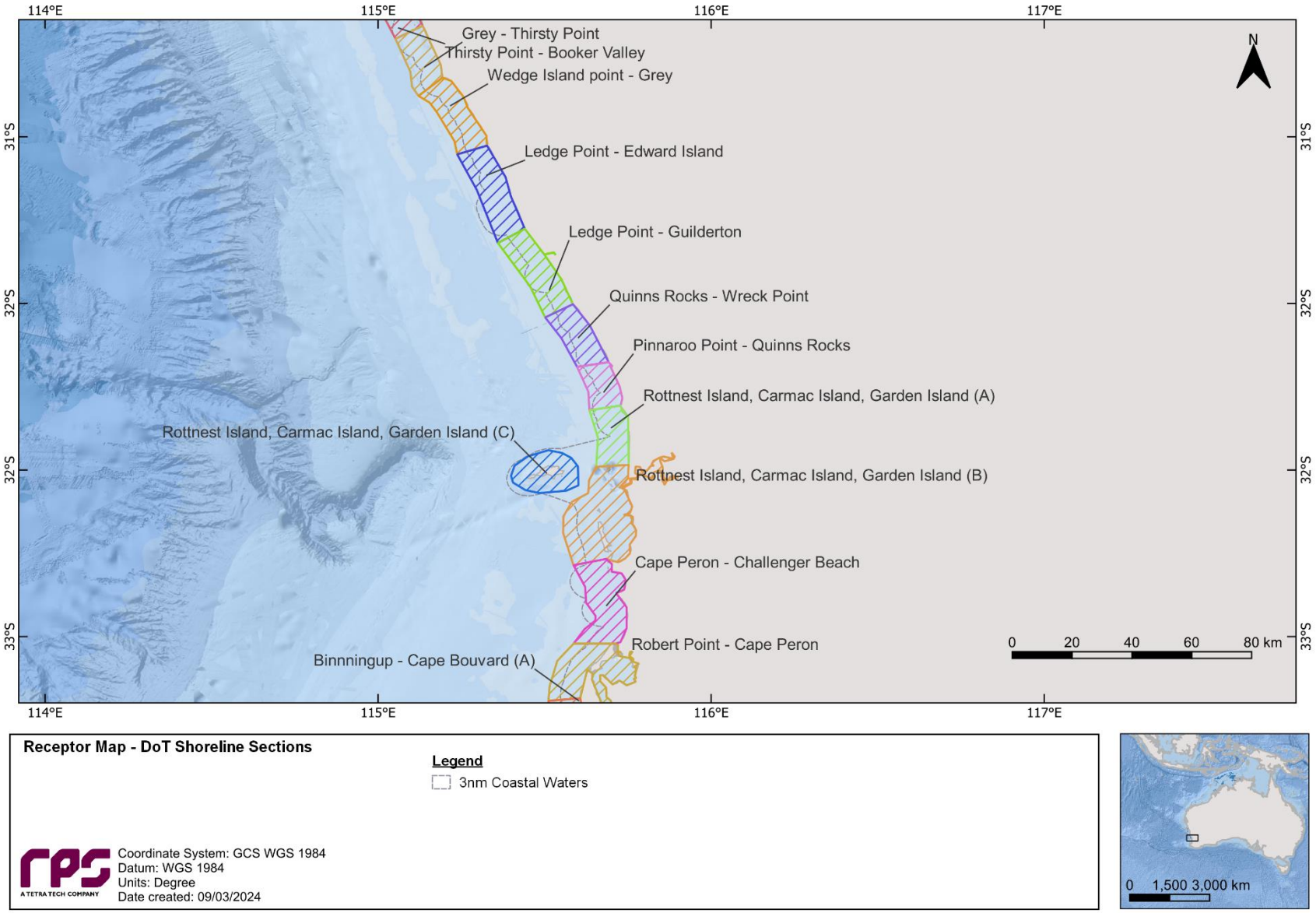

Figure 9.19 Receptor map for the WAMOPRA shoreline cells (10 of 10).

10 MODEL SETTINGS

Table 10.1 provides a summary of the oil spill model settings for Scenario 1 and Scenario 2. Additionally, Table 10.2 presents the summary of the daily varying oil rate applied for Scenario 1.

The simulation length for each scenario was carefully selected based on extensive sensitivity testing. During the sensitivity testing process, sample spill trajectories are run for longer than intended durations for each scenario. Upon completion of the spill trajectories, the results are carefully assessed to examine the persistence of the hydrocarbon (i.e. whether the maximum evaporative loss has been achieved for the period modelled; and whether a substantial volume of hydrocarbons remain in the water column (if any)) in conjunction with the extent of sea surface exposure based on reporting thresholds. Once there is agreement between the two factors (i.e., the final fate of hydrocarbon is accounted for, and the full exposure area is identified) the simulation length is deemed appropriate.

Table 10.1 Summary of the oil spill model settings used in this assessment.

	Scenario 1	Scenario 2
Description	Surface LOWC	Surface release from vessel collision
Number of spill simulations with randomly selected start times	100 per season	
Period	Summer (October to February) Winter (April to July) Transitional (March, August, and September)	
Spill volume	167,800 bbl (26,678 m^3)	300 m^3
Oil type	Wandoo crude	MDO
Release depth	0 m (surface)	0 m (surface)
Release duration	35 days	6 hours
Simulation length	56 days	30 days
Floating oil (NOPSEMA) thresholds	1 g/m^2, low exposure 10 g/m^2, moderate exposure 50 g/m^2, high exposure	
Shoreline accumulation (NOPSEMA) thresholds	10 g/m^2, low exposure 100 g/m^2, moderate exposure 1,000 g/m^2, high exposure	
Dissolved hydrocarbon (NOPSEMA) thresholds	10 ppb over 1 hour, low exposure 50 ppb over 1 hour, moderate exposure 400 ppb over 1 hour, high exposure	
Entrained hydrocarbon (NOPSEMA) thresholds	10 ppb over 1 hour, low exposure 100 ppb over 1 hour, moderate exposure	

Table 10.2 Summary of the daily varying oil rate applied for the surface LOWC.

Days	Oil Rate (stb/day)
1	5855.8
2	5767.2
3	5680.2
4	5594.6
5	5510.4
6	5427.7
7	5346.3
8	5266.3
9	5187.6
10	5110.2
11	5034.1
12	4959.3
13	4885.7
14	4813.3
15	4752.3
16	4741.1
17	4732.3
18	4723.6
19	4714.9
20	4706.2
21	4697.6
22	4689.0
23	4680.5
24	4672.0
25	4663.5
26	4655.1
27	4646.7
28	4638.4
29	4630.1
30	4621.8
31	4613.5
32	4605.3
33	4597.2
34	4589.0
35	4580.9

11 PRESENTATION AND INTERPRETATION OF MODEL RESULTS

The results from the modelling study are presented in a number of tables and figures, which aim to provide an understanding of the predicted sea-surface and water column (subsurface) exposure, and shoreline accumulation (if predicted).

11.1 Stochastic Modelling

If readers are not fully familiar with how to interpret stochastic modelling outputs, please refer to the relevant NOPSEMA factsheet (NOPSEMA, 2018) before reading this report section.

Predictions for the probability of contact and time to contact by oil concentrations equalling or exceeding defined thresholds for floating and shoreline oil, entrained oil and dissolved hydrocarbons are provided in the following sections to summarise the stochastic results, which are calculated and presented as follows:

a. ***Exposure Areas*** – encompasses the entire area that could be exposed and was derived from the annual stochastic modelling results based on the following thresholds:

   Low threshold Exposure Area (or EMBA)

   i. Floating oil – 1 g/m^2;
   ii. Shoreline oil accumulation – 10 g/m^2;
   iii. Dissolved hydrocarbons – 10 ppb; and
   iv. Entrained hydrocarbons –10 ppb.

   Moderate Threshold Exposure Area

   i. Floating oil – 10 g/m^2;
   ii. Shoreline oil accumulation – 100 g/m^2;
   iii. Dissolved hydrocarbons – 50 ppb; and
   iv. Entrained hydrocarbons –100 ppb.

   High Threshold Exposure Area

   i. Floating oil – 50 g/m^2;
   ii. Shoreline oil accumulation – 1,000 g/m^2; and
   iii. Dissolved hydrocarbons – 400 ppb.

b. ***Cross-sections of entrained and dissolved hydrocarbon concentrations*** – the predicted maximum entrained and dissolved hydrocarbon concentrations within the water column, along east-west and north-south transects in the vicinity of the release location.

c. ***Predicted zones of potential exposure*** – maps of floating oil exposure, shoreline oil accumulation, entrained and dissolved hydrocarbon exposure were generated based on the following thresholds:

   i. Floating oil – 1-10 g/m^2 (Low), 10-50 g/m^2 (Moderate) and ≥50 g/m^2 (High);
   ii. Shoreline oil accumulation – 10-100 g/m^2 (Low), 100-1,000 g/m^2 (Moderate) and ≥1,000 g/m^2 (High);
   iii. Entrained hydrocarbons – 10-100 ppb (Low) and ≥100 ppb (Moderate); and
   iv. Dissolved hydrocarbons – 10-50 ppb (Low), 50-400 ppb (Moderate) and ≥400 ppb (High).

d. ***The probability of oil exposure on the sea surface, in-water or shorelines*** – is calculated by dividing the number of spill simulations passing over a given grid cell at a given threshold, divided by the total number of simulations.

e. ***The minimum time before oil exposure on the sea surface, in-water or shorelines*** – is determined by ranking the elapsed time before sea surface exposure, entrained oil exposure or shoreline accumulation (at a given threshold) to a given location/grid cell for each of the spill simulations.

f. ***The maximum local accumulated concentration averaged over all replicate spills*** – the greatest concentration calculated for any point on the shoreline after averaging over all replicate simulations.

g. ***The maximum local accumulated concentration in the worst replicate spill*** – the greatest accumulation predicted for any point on the shoreline during any replicate simulation, and thus represents an extreme estimate.

h. ***The average volume of oil ashore*** – is determined by averaging the volume of oil ashore across all simulations predicted to make shoreline contact.

i. ***The maximum volume of oil ashore in the worst replicate spill*** – the greatest volume of oil predicted for any point on the shoreline during any replicate simulation, and thus represents an extreme estimate.

The mean and maximum shoreline concentrations indicate the concentrations forecast to potentially accumulate over time on any discrete part of a shoreline; calculated for individual portions of 1 km in length. Accumulated concentrations are calculated by summing the mass of oil that arrives at any concentration (including < threshold) over time at a model cell and subtracting any mass lost through evaporation and washing off, where relevant.

Note that it is possible that oil films arriving at concentrations that are less than the threshold may accumulate over the course of a spill event to result in concentrations that apparently exceed the threshold. Hence, the mean expected, and maximum concentrations of accumulated oil can exceed the threshold applied to the probability calculations for the arrival of floating oil even where no instantaneous exceedances above threshold are predicted. It is important to understand that the two parameters (floating concentration and shoreline concentration) are quite distinct, calculated in different ways and representative of alternative outcomes. The floating probability estimates, and the shoreline accumulative estimates should therefore be treated as independent estimators of different exposure outcomes, and not directly compared.

Readers should note that the contour maps presented in the stochastic modelling results, do not represent the predicted coverage of any one hydrocarbon spill or a depiction of a slick or plume at any instant in time. Rather, the contours are a composite of many theoretical slick paths, integrated over the full duration of the simulations relevant to each scenario. The stochastic modelling contour maps should be treated as indications of the probability of exposure at defined concentrations, for individual locations, at some point in time after the defined spill commences, given the trends and variations in metocean conditions that occur around the study area.

Locations with higher probability ratings were exposed during a greater number of spill simulations, indicating that the combination of the prevailing wind and current conditions are more likely to result in contact to these locations if the spill scenario were to occur in the future. The areas outside of the lowest-percentage contour indicate that contact will be less likely under the range of prevailing conditions for this region than areas falling within higher probability contours. It is important to note that the probabilities are derived from the samples of data used in the modelling. Therefore, locations that are not calculated to receive exposure at threshold concentrations or greater in any of the replicate simulations might possibly be contacted if very unusual conditions were to occur. Hence, we do not attribute a probability of nil to areas beyond the lowest probability contour.

11.2 Deterministic Modelling

While the stochastic modelling results provide an objective indication of all locations that may be exposed or contacted by oil above the reporting thresholds, the approach describes a larger potential area of influence than can be expected from any one single spill event. To inform spill response and OSM BIP capability requirements the following deterministic simulation for the LOWC scenario was identified and presented:

a. Greatest number of receptors with floating oil exposure at or above 1 g/m^2 within the first 7 days.

The following outputs have been presented for the deterministic simulation identified:

Tabulated results

- Minimum times to floating oil exposure for each threshold.
- Minimum times to entrained hydrocarbon exposure for each threshold.
- Minimum time to oil accumulation for each threshold at all shoreline receptors.
- Maximum loading and length of shoreline oil accumulation for each threshold; and
- Maximum shoreline oil accumulated volume for each threshold at all shoreline receptors.

Maps

- Map the outer boundaries of the EMBA derived from the 'low' threshold exposure values for floating oil exposure, in-water (entrained and dissolved) and shoreline accumulation.
- Maps of the predicted zones of floating oil exposure, in-water exposure (entrained and dissolved) and shoreline accumulation over the entire 56-day simulation; and
- Fates and weathering graph for the corresponding single spill trajectory, and a summary of the volumes at the conclusion of the simulation.

12 CALCULATION OF STOCHASTIC MODELLING EXPOSURE RISKS

During each simulation, the SIMAP model records the location (by latitude, longitude, and depth) of particles, which represent a mass of oil, on or, in the water column at regular time steps. For particles that contact the shoreline, the model records the accumulation of oil mass on each shoreline section over time, accounting for any mass lost to evaporation or removal by current and/or wind forces.

The data from all simulations are then analysed by dividing the study region into a three-dimensional grid. For particles classified as floating oil, the concentration of oil in each grid cell is estimated by summing the mass of all oil particles within that cell (factoring in spreading and dispersion) and dividing by the area of the grid cell. For entrained and dissolved oil, concentrations are calculated by dividing the mass of particles by the volume of the grid cell.

These oil concentrations are then examined to determine whether they exceed specific threshold levels over time. The risks are summarised as follows:

- The probability of exposure is calculated by dividing the number of spill simulations in which oil concentrations exceeded the threshold in a grid cell by the total number of simulations. For instance, if oil exposure above the threshold occurred in 21 out of 100 simulations, the probability of exposure for that location is 21%;
- The minimum potential time before exposure is determined by the shortest time it took for oil above the threshold concentration to travel from the release site to a grid cell in any of the simulations;
- Maximum potential oil accumulation on shorelines is calculated as the highest oil mass per square meter (m^2) in any simulation for a shoreline cell during any of the simulations;
- The average of the maximum oil accumulation is calculated as the average of the greatest oil mass per m^2 across all simulations.
- Similar calculations are undertaken for entrained oil and dissolved hydrocarbons.

Thus, the minimum time before oil accumulation on shorelines and maximum accumulation represent the worst case outcomes for each shoreline section, while the average provides a more general outlook of the potential outcomes.

It is important to clarify that each grid cell would be approximately 1 km and with shorelines stretching tens to hundreds of kilometres, that the maximum potential loading reported for any grid cell do not imply that such concentrations will occur uniformly across the entire section. Therefore, multiplying the maximum concentration estimates by the total area of the section would significantly overestimate the expected oil volume on that section. Furthermore, with a grid resolution of 1 km, it is not possible to resolve shorelines <100 m.

13 MODELLING RESULTS: LOSS OF WELL CONTROL

This scenario investigated the potential exposure from a 167,800 bbl (26,678 m^3) surface release of crude over 35 days resulting from a LOWC at Kullingal. The crude was tracked for an additional 21 days to allow the concentrations to decrease below the lowest thresholds. The modelling for this scenario assumed no mitigation efforts are undertaken to collect or otherwise affect the natural transport and weathering.

13.1 Stochastic Analysis

13.1.1 Exposure Areas

Figure 13.1 illustrates the exposure areas for the LOWC scenario, determined by integrating the low, moderate, and high threshold results of all 300 spill simulations.

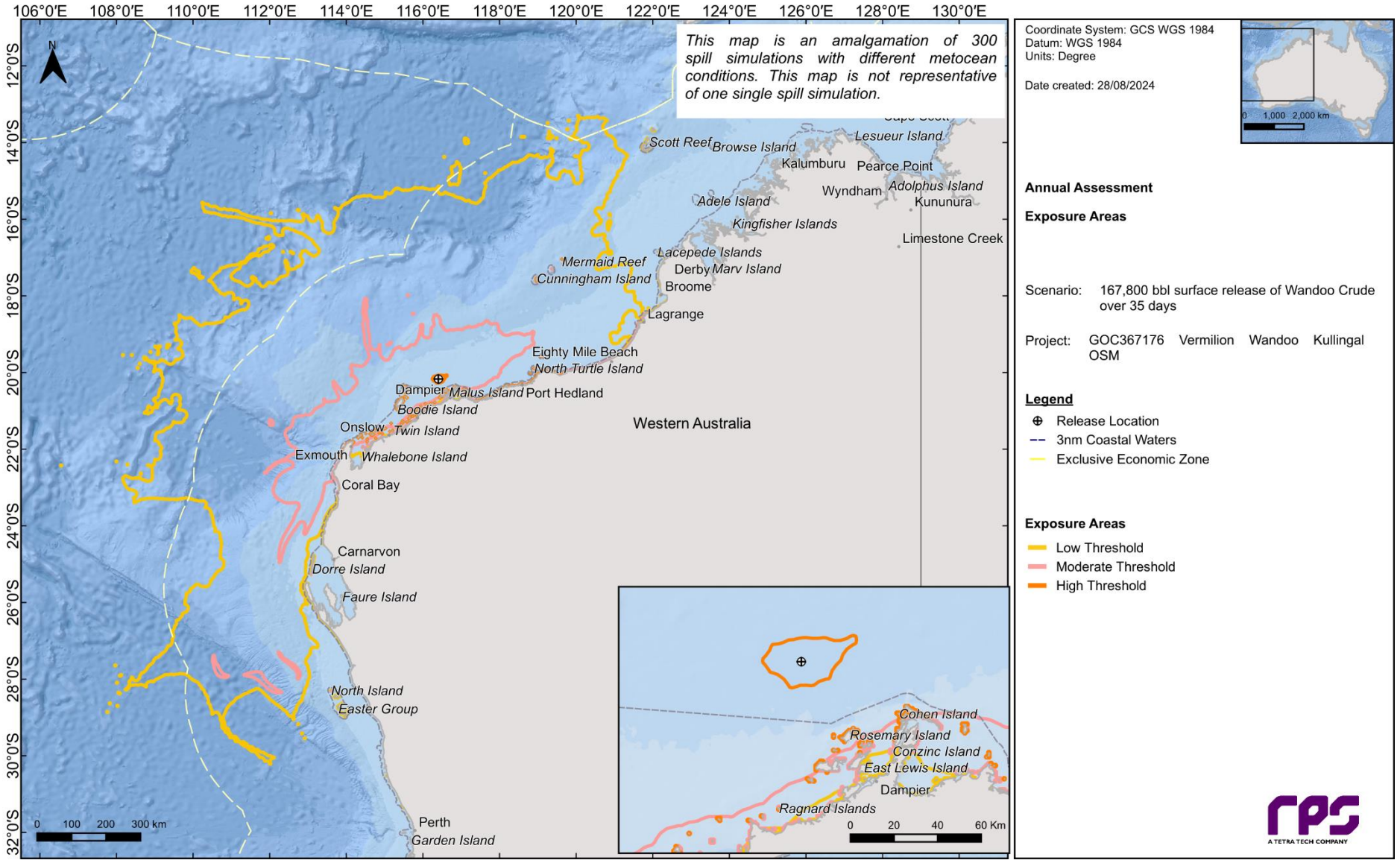

Figure 13.1 Predicted exposure areas following a surface LOWC at Kullingal, presented as an annual assessment. The exposure areas were determined by integrating the results of all 300 spill simulations across low, moderate and high thresholds.

13.1.2 Floating Oil Exposure

Table 13.1 summarises the maximum distances from the release location to floating oil exposure thresholds for each season. Concentrations exceeding 1 g/m^2 could extend up to 998 km from the release location. The maximum distances reduced to 473 km and 25 km as the threshold increases to 10 g/m^2 and 50 g/m^2, respectively.

Table 13.2 present the receptors predicted to be exposed by floating oil for each season.

The Glomar Shoals KEF (60%), Montebello AMP (79%) and Mermaid Reef AMP (97%) recorded the highest probability of exposure at, or above, 1 g/m^2 during summer, transitional and winter conditions, respectively. The Montebello AMP recorded the fastest time to exposure at 37 hours, for a spill commencing during transitional conditions.

Figure 13.2 to Figure 13.4 illustrate the extent floating oil exposure zones for each season. Figure 13.5 to Figure 13.22 depict the seasonal minimum times before exposure and probability of exposure for assessed thresholds.

Table 13.1 Maximum distances from the release location to floating oil exposure thresholds from a surface LOWC at Kullingal. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Floating oil exposure thresholds		
		1 g/m^2	10 g/m^2	50 g/m^2
Summer	Maximum distance (km) from release location	647	55	15
	Direction	Northeast	West	East
Transitional	Maximum distance (km) from release location	998	473	25
	Direction	Southwest	West	Northeast
Winter	Maximum distance (km) from release location	741	311	13
	Direction	Northeast	Southwest	West

Table 13.2 Receptors predicted to be exposed by floating oil following a surface LOWC at Kullingal. Results were calculated from100 spill simulations per season.

Category	Name	Summer						Transitional						Winter					
		Probability (%) of floating oil at			Minimum times before floating oil exposure (hours)			Probability (%) of floating oil at			Minimum times before floating oil exposure (hours)			Probability (%) of floating oil at			Minimum times before floating oil exposure (hours)		
		≥ 1 g/m^2	≥ 10 g/m^2	≥ 50 g/m^2	≥ 1 g/m^2	≥ 10 g/m^2	≥ 50 g/m^2	≥ 1 g/m^2	≥ 10 g/m^2	≥ 50 g/m^2	≥ 1 g/m^2	≥ 10 g/m^2	≥ 50 g/m^2	≥ 1 g/m^2	≥ 10 g/m^2	≥ 50 g/m^2	≥ 1 g/m^2	≥ 10 g/m^2	≥ 50 g/m^2
AMP	Argo-Rowley Terrace	2	NC	NC	689	NC	NC	4	NC	NC	708	NC	NC	4	NC	NC	521	NC	NC
	Carnarvon Canyon	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	1,265	NC	NC
	Dampier	32	NC	NC	76	NC	NC	12	NC	NC	261	NC	NC	2	NC	NC	415	NC	NC
	Gascoyne	5	NC	NC	317	NC	NC	23	1	NC	320	1,183	NC	29	1	NC	240	605	NC
	Mermaid Reef	2	NC	NC	925	NC	NC	1	NC	NC	1,286	NC	NC	97	2	NC	38	122	NC
	Montebello	53	4	NC	63	64	NC	79	3	NC	37	108	NC	NC	NC	NC	NC	NC	NC
KEF	Ancient coastline at 125 m depth contour	33	NC	NC	173	NC	NC	46	NC	NC	150	NC	NC	56	5	NC	109	335	NC
	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	10	NC	NC	298	NC	NC	27	NC	NC	273	NC	NC	42	NC	NC	182	NC	NC
	Commonwealth waters adjacent to Ningaloo Reef	4	NC	NC	381	NC	NC	30	2	NC	298	696	NC	34	1	NC	218	474	NC
	Continental Slope Demersal Fish Communities	18	NC	NC	201	NC	NC	42	1	NC	193	1,078	NC	31	3	NC	168	508	NC
	Exmouth Plateau	5	NC	NC	429	NC	NC	9	NC	NC	319	NC	NC	7	NC	NC	415	NC	NC
	Glomar Shoals	60	NC	NC	100	NC	NC	47	NC	NC	109	NC	NC	48	7	NC	63	101	NC
	Mermaid Reef and Commonwealth waters surrounding Rowley Shoals	3	NC	NC	688	NC	NC	1	NC	NC	913	NC	NC	4	NC	NC	639	NC	NC
	Western demersal slope and associated fish communities	NC	NC	NC	NC	NC	NC	1	NC	NC	676	NC	NC	NC	NC	NC	NC	NC	NC
MP	Barrow Island	14	NC	NC	199	NC	NC	29	NC	NC	144	NC	NC	38	NC	NC	108	NC	NC

	Eighty Mile Beach	2	NC	NC	573	NC	NC	1	NC	NC	770	NC	NC	NC	NC	NC	NC	NC	NC
	Montebello Islands	18	NC	NC	170	NC	NC	37	3	NC	130	768	NC	72	5	NC	78	570	NC
	Ningaloo	4	NC	NC	381	NC	NC	30	2	NC	298	696	NC	34	1	NC	218	474	NC
	Rowley Shoals	1	NC	NC	719	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	683	NC	NC
NR	Barrow Island	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	420	NC	NC
	Great Sandy Island	2	NC	NC	562	NC	NC	1	NC	NC	657	NC	NC	3	NC	NC	627	NC	NC
	Lowendal Islands	2	NC	NC	906	NC	NC	1	NC	NC	919	NC	NC	19	NC	NC	268	NC	NC
	Thevenard Island	1	NC	NC	743	NC	NC	7	NC	NC	203	NC	NC	9	NC	NC	290	NC	NC
RSB	Australind Shoal	1	NC	NC	759	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	445	NC	NC
	Barrow Island Reefs and Shoals	2	NC	NC	942	NC	NC	2	NC	NC	556	NC	NC	4	NC	NC	589	NC	NC
	Baylis Patches	1	NC	NC	792	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	482	NC	NC
	Brewis Reef	1	NC	NC	720	NC	NC	8	NC	NC	204	NC	NC	9	NC	NC	308	NC	NC
	Clerke Reef	1	NC	NC	796	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Cod Bank	10	NC	NC	377	NC	NC	8	NC	NC	552	NC	NC	1	NC	NC	617	NC	NC
	Combe Reef	NC	NC	NC	NC	NC	NC	2	NC	NC	638	NC	NC	2	NC	NC	381	NC	NC
	Courtenay Shoal	4	NC	NC	190	NC	NC	3	NC	NC	748	NC	NC	NC	NC	NC	NC	NC	NC
	Curlew Bank	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	475	NC	NC
	Dailey Shoal	3	NC	NC	719	NC	NC	12	NC	NC	428	NC	NC	8	NC	NC	263	NC	NC
	Dockrell Reef	NC	NC	NC	NC	NC	NC	4	NC	NC	712	NC	NC	1	NC	NC	1,310	NC	NC
	Fairway Reef	1	NC	NC	709	NC	NC	2	NC	NC	423	NC	NC	1	NC	NC	373	NC	NC
	Flinders Shoal	2	NC	NC	945	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Glennie Patches	1	NC	NC	781	NC	NC	NC	NC	NC	NC	NC	NC	3	NC	NC	444	NC	NC
	Glomar Shoal	39	NC	NC	201	NC	NC	28	NC	NC	208	NC	NC	32	NC	NC	108	NC	NC
	Gorgon Patch	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	450	NC	NC
	Hammersley Shoal	20	2	NC	166	207	NC	8	NC	NC	458	NC	NC	2	NC	NC	1,087	NC	NC
	Hastings Shoal	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	5	NC	NC	342	NC	NC
	Hayman Rock	1	NC	NC	795	NC	NC	NC	NC	NC	NC	NC	NC	3	NC	NC	481	NC	NC
	Herald Reef	1	NC	NC	1,051	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Hood Reef	2	NC	NC	672	NC	NC	4	NC	NC	613	NC	NC	6	NC	NC	272	NC	NC
	Imperieuse Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2	NC	NC	905	NC	NC
	Inner Northwest Patch	1	NC	NC	769	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	448	NC	NC
	Koolinda Patch	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	475	NC	NC
	Lightfoot Reef	1	NC	NC	1,056	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Little Shoals	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	5	NC	NC	350	NC	NC
	Locker Reef	1	NC	NC	719	NC	NC	1	NC	NC	625	NC	NC	5	NC	NC	476	NC	NC
	Madeleine Shoals	28	NC	NC	167	NC	NC	9	NC	NC	277	NC	NC	2	NC	NC	528	NC	NC

	Manicom Bank	1	NC	NC	790	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	466	NC	NC
	McLennan Bank	5	NC	NC	713	NC	NC	1	NC	NC	500	NC	NC	9	NC	NC	372	NC	NC
	Meda Reef	1	NC	NC	564	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Mermaid Reef	2	NC	NC	930	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Miles Shoal	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	461	NC	NC
	Montebello Shoals	13	NC	NC	246	NC	NC	30	NC	NC	145	NC	NC	42	NC	NC	123	NC	NC
	Moresby Shoals	1	NC	NC	1,144	NC	NC	NC	NC	NC	NC	NC	NC	5	NC	NC	364	NC	NC
	Nares Rock	1	NC	NC	1,148	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Ningaloo Reef	1	NC	NC	935	NC	NC	6	NC	NC	663	NC	NC	NC	NC	NC	NC	NC	NC
	North West Reef	5	NC	NC	495	NC	NC	5	NC	NC	572	NC	NC	1	NC	NC	1,307	NC	NC
	O'Grady Shoal	NC	NC	NC	NC	NC	NC	1	NC	NC	617	NC	NC	1	NC	NC	400	NC	NC
	Otway Reef	1	NC	NC	1,148	NC	NC	7	NC	NC	628	NC	NC	7	NC	NC	342	NC	NC
	Outtrim Patches	3	NC	NC	699	NC	NC	9	NC	NC	419	NC	NC	6	NC	NC	283	NC	NC
	Paroo Shoal	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	455	NC	NC
	Penguin Bank	6	NC	NC	409	NC	NC	18	NC	NC	252	NC	NC	24	NC	NC	224	NC	NC
	Poivre Reef	3	NC	NC	455	NC	NC	17	NC	NC	295	NC	NC	16	NC	NC	287	NC	NC
	Rankin Bank	21	NC	NC	321	NC	NC	30	NC	NC	267	NC	NC	47	NC	NC	190	NC	NC
	Ripple Shoals	2	NC	NC	887	NC	NC	3	NC	NC	350	NC	NC	6	NC	NC	306	NC	NC
	Roller Shoal	1	NC	NC	807	NC	NC	NC	NC	NC	NC	NC	NC	3	NC	NC	466	NC	NC
	Rosily Shoals	6	NC	NC	424	NC	NC	17	NC	NC	184	NC	NC	26	NC	NC	186	NC	NC
	Saladin Shoal	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	457	NC	NC
	Santo Rock	3	NC	NC	732	NC	NC	2	NC	NC	731	NC	NC	3	NC	NC	456	NC	NC
	South East Reef	2	NC	NC	504	NC	NC	1	NC	NC	890	NC	NC	NC	NC	NC	NC	NC	NC
	South West Reef	4	NC	NC	503	NC	NC	1	NC	NC	875	NC	NC	NC	NC	NC	NC	NC	NC
	Southwest Patch	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	3	NC	NC	480	NC	NC
	Spider Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	678	NC	NC
	Sultan Reef	1	NC	NC	761	NC	NC	2	NC	NC	305	NC	NC	6	NC	NC	291	NC	NC
	Taunton Reef	NC	NC	NC	NC	NC	NC	3	NC	NC	614	NC	NC	6	NC	NC	306	NC	NC
	Tongue Shoals	1	NC	NC	758	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	448	NC	NC
	Trap Reef	2	NC	NC	708	NC	NC	7	NC	NC	285	NC	NC	8	NC	NC	359	NC	NC
	Tryal Rocks	19	NC	NC	125	NC	NC	40	NC	NC	86	NC	NC	65	NC	NC	137	NC	NC
	Ward Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	5	NC	NC	391	NC	NC
	Web Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	686	NC	NC
	Weeks Shoal	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	327	NC	NC
	West Reef	1	NC	NC	1,048	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
State and Territory Waters	WA	40	4	NC	53	125	NC	52	9	NC	37	52	NC	89	5	NC	31	74	NC

NC: No contact to receptor predicted for specified threshold.

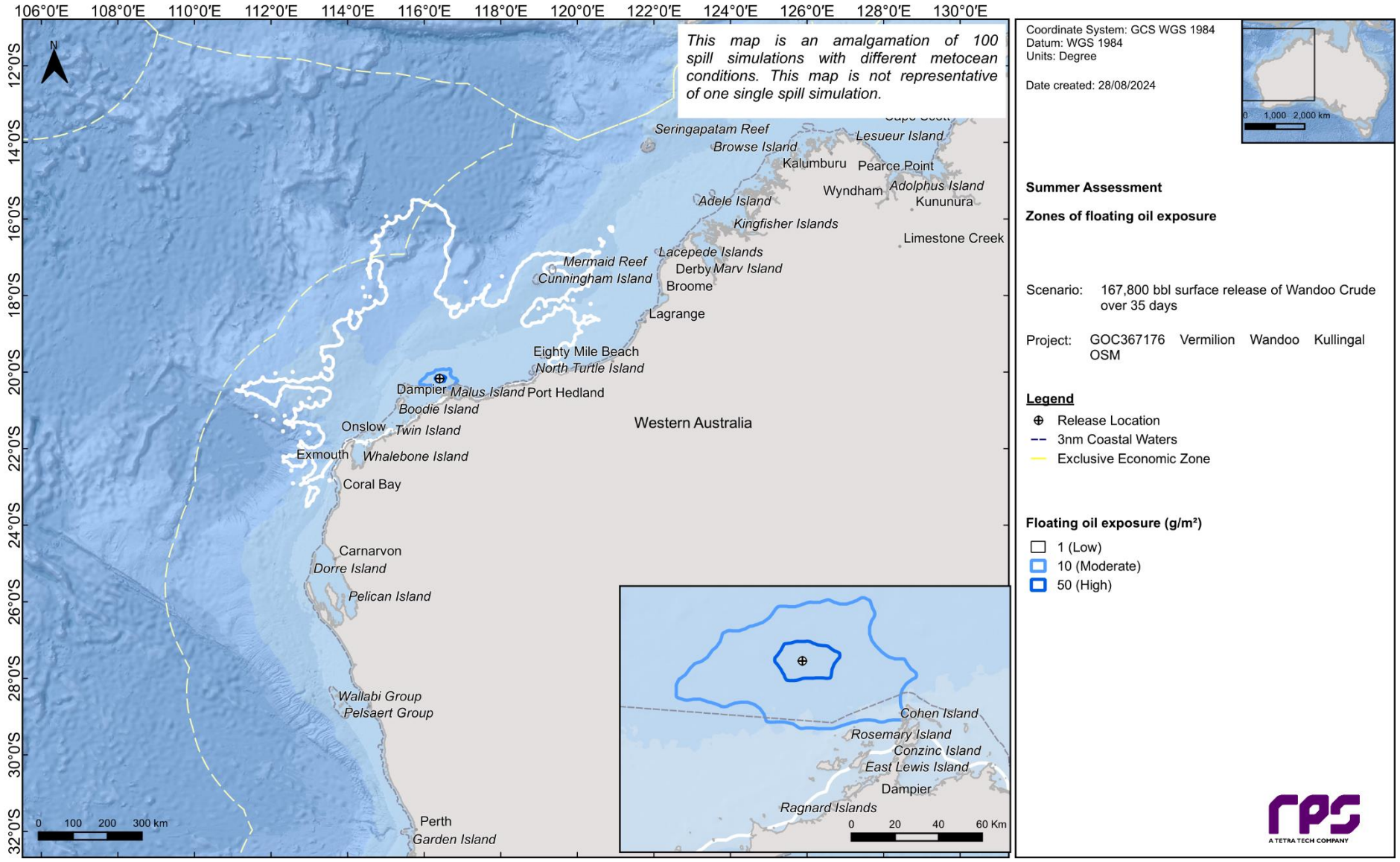

Figure 13.2 Predicted zones of floating oil exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

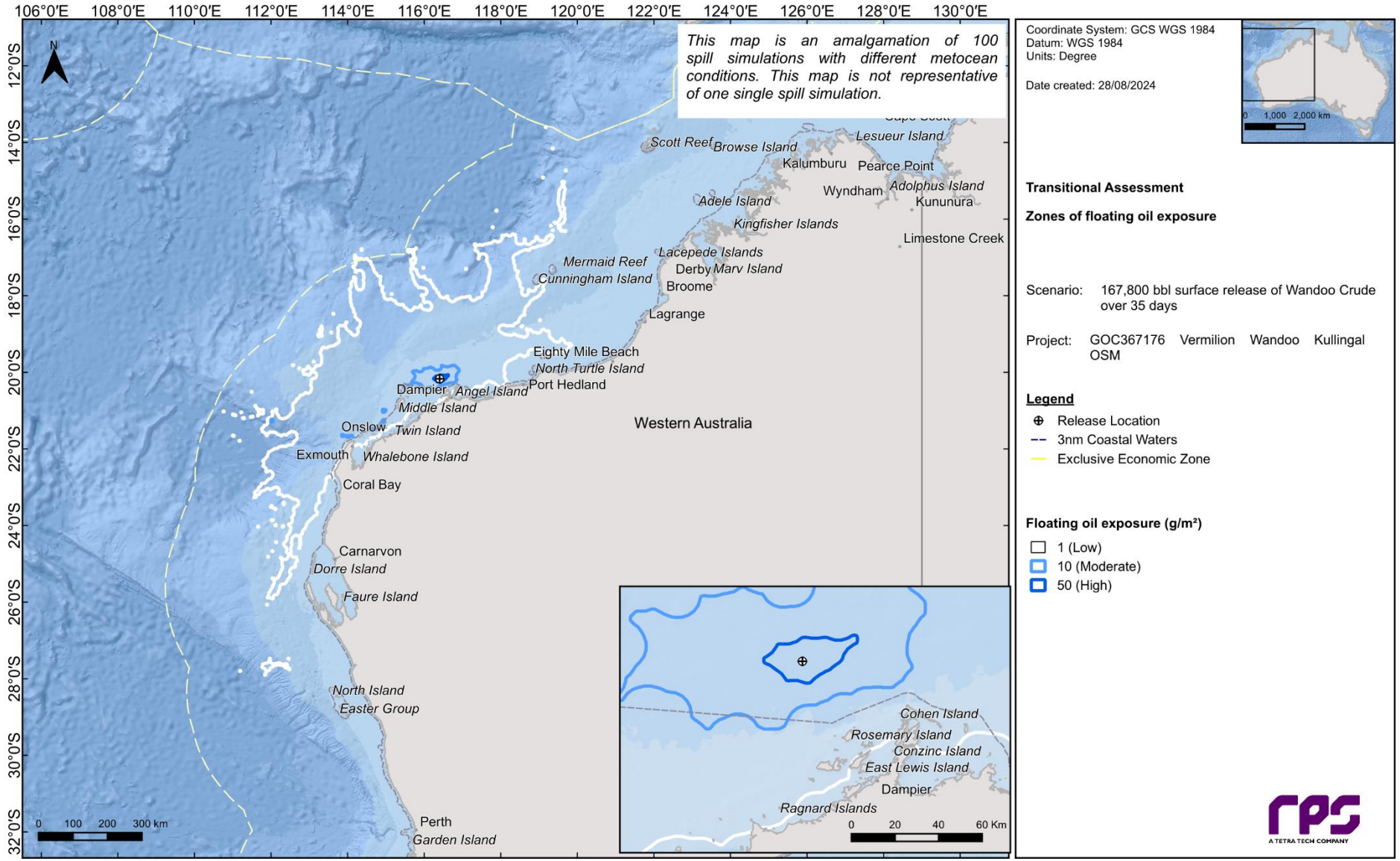

Figure 13.3 Predicted zones of floating oil exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

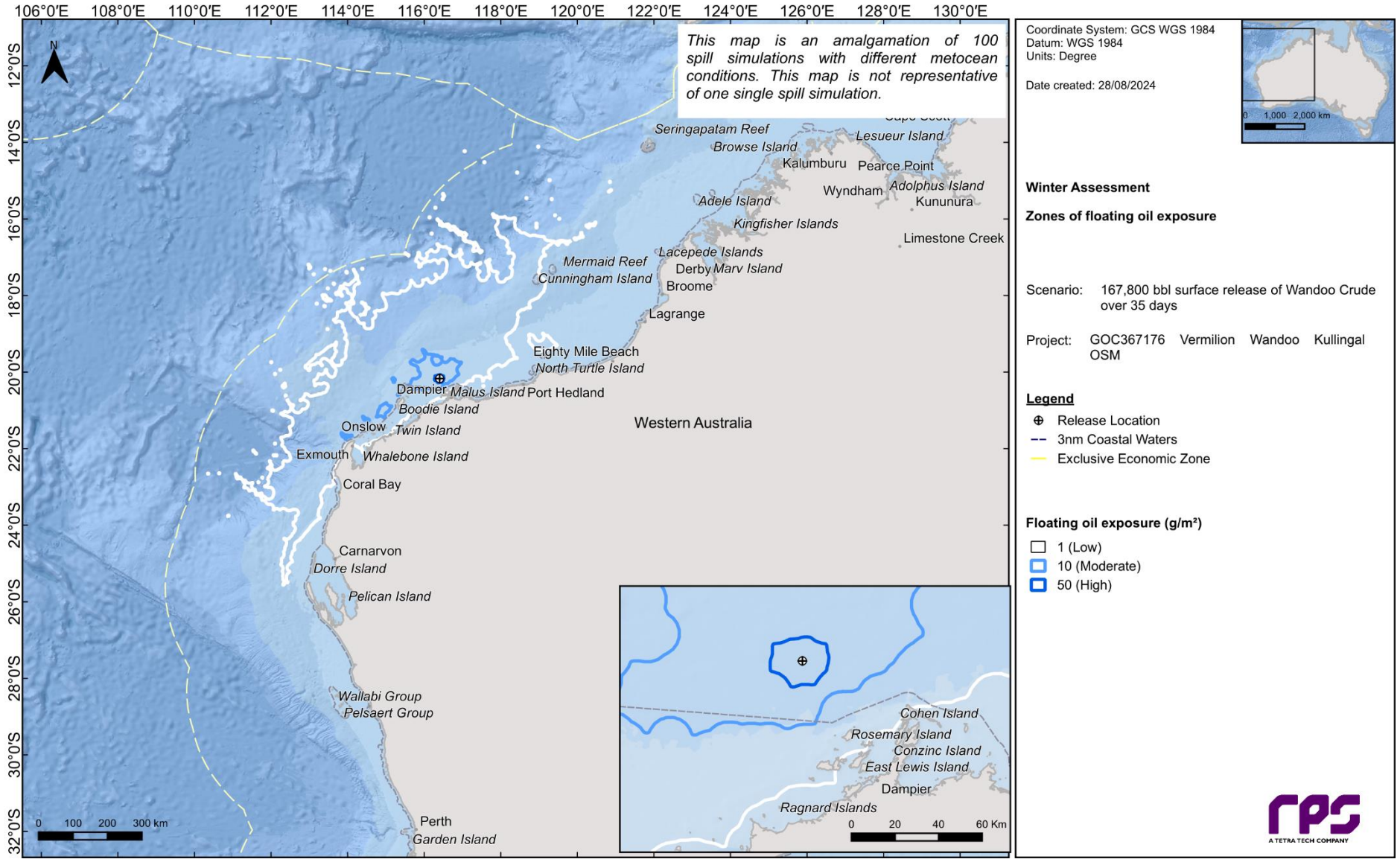

Figure 13.4 Predicted zones of floating oil exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

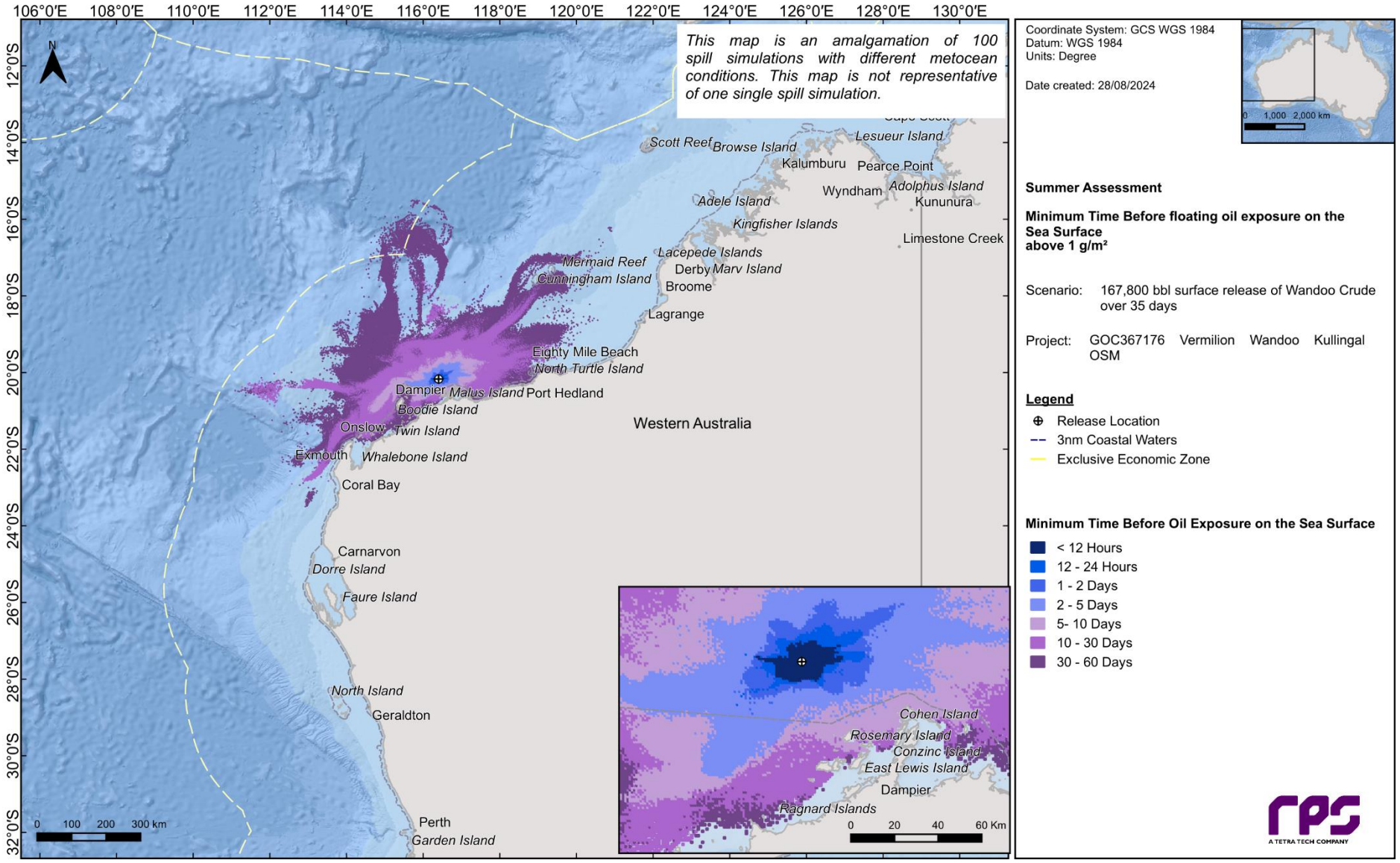

Figure 13.5 Minimum time before floating oil exposure at, or above, 1 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

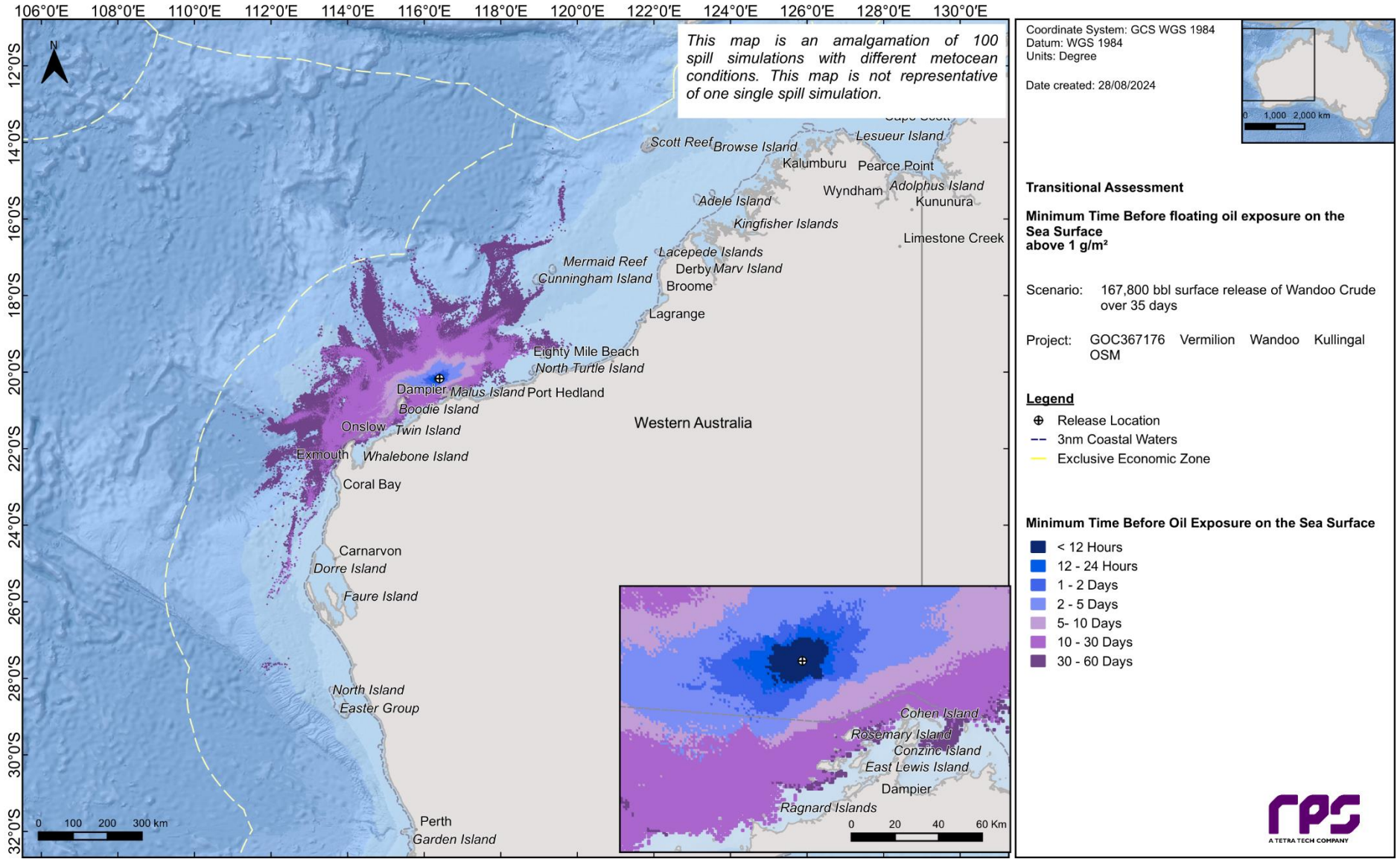

Figure 13.6 Minimum time before floating oil exposure at, or above, 1 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

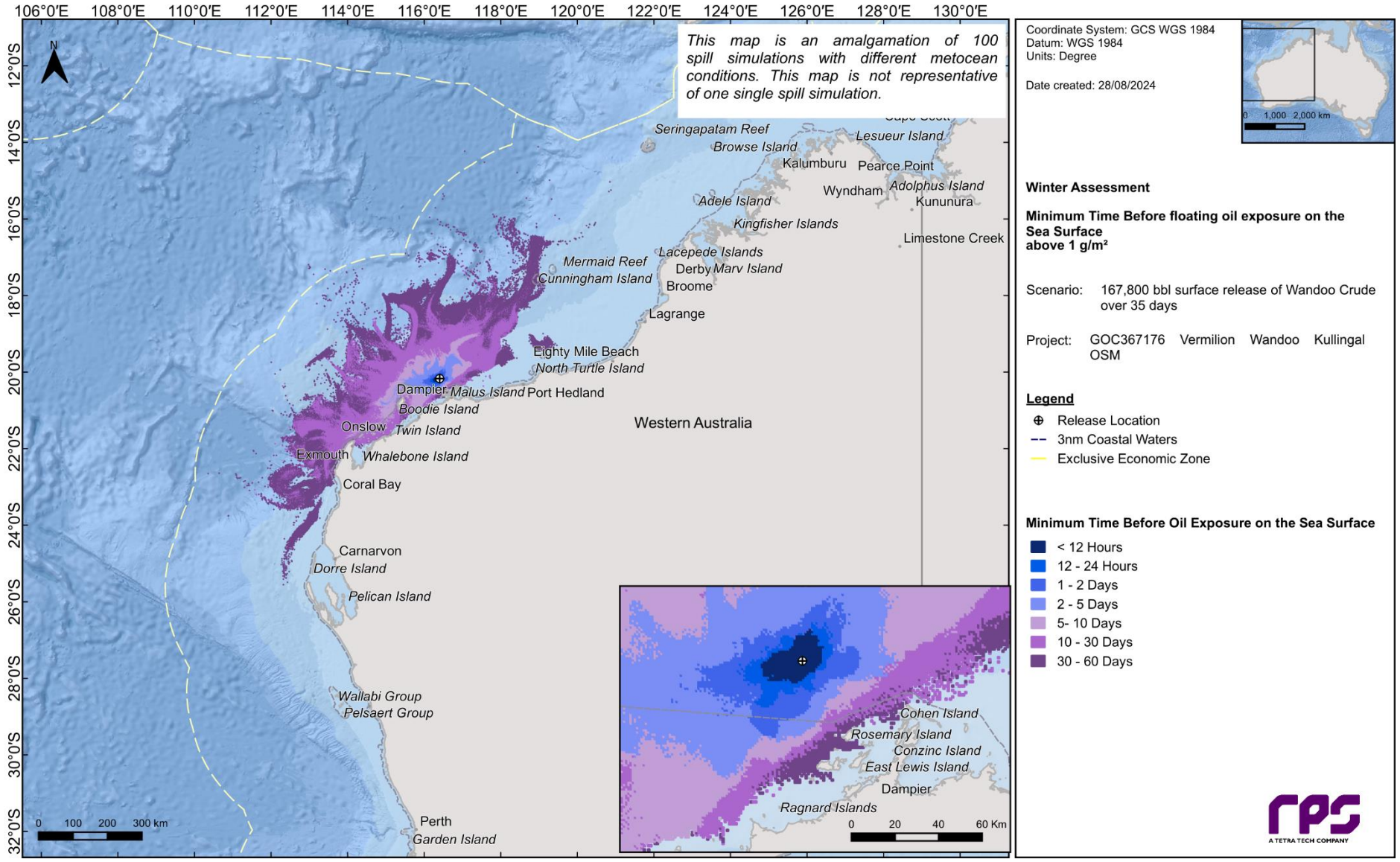

Figure 13.7 Minimum time before floating oil exposure at, or above, 1 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

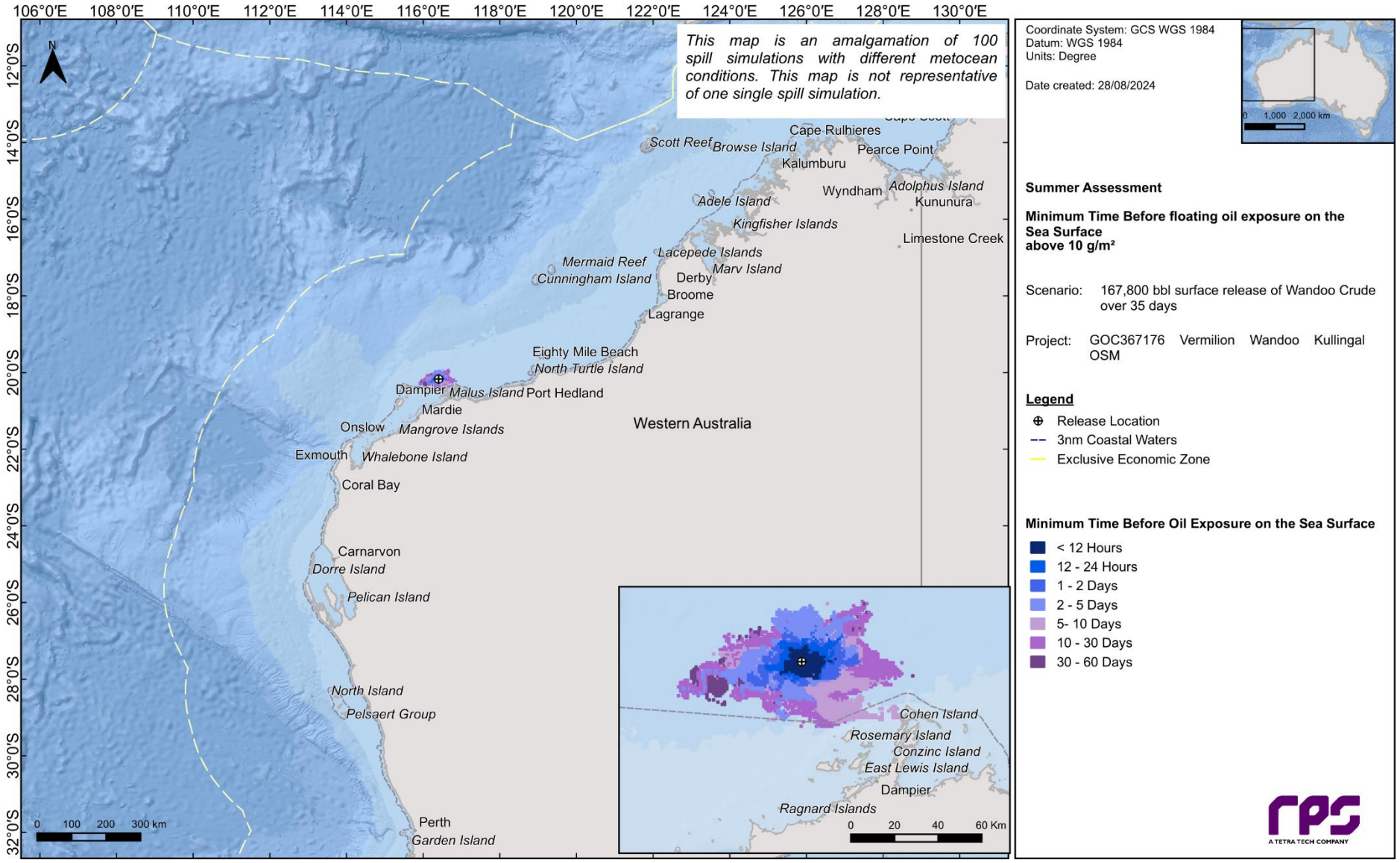

Figure 13.8 Minimum time before floating oil exposure at, or above, 10 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

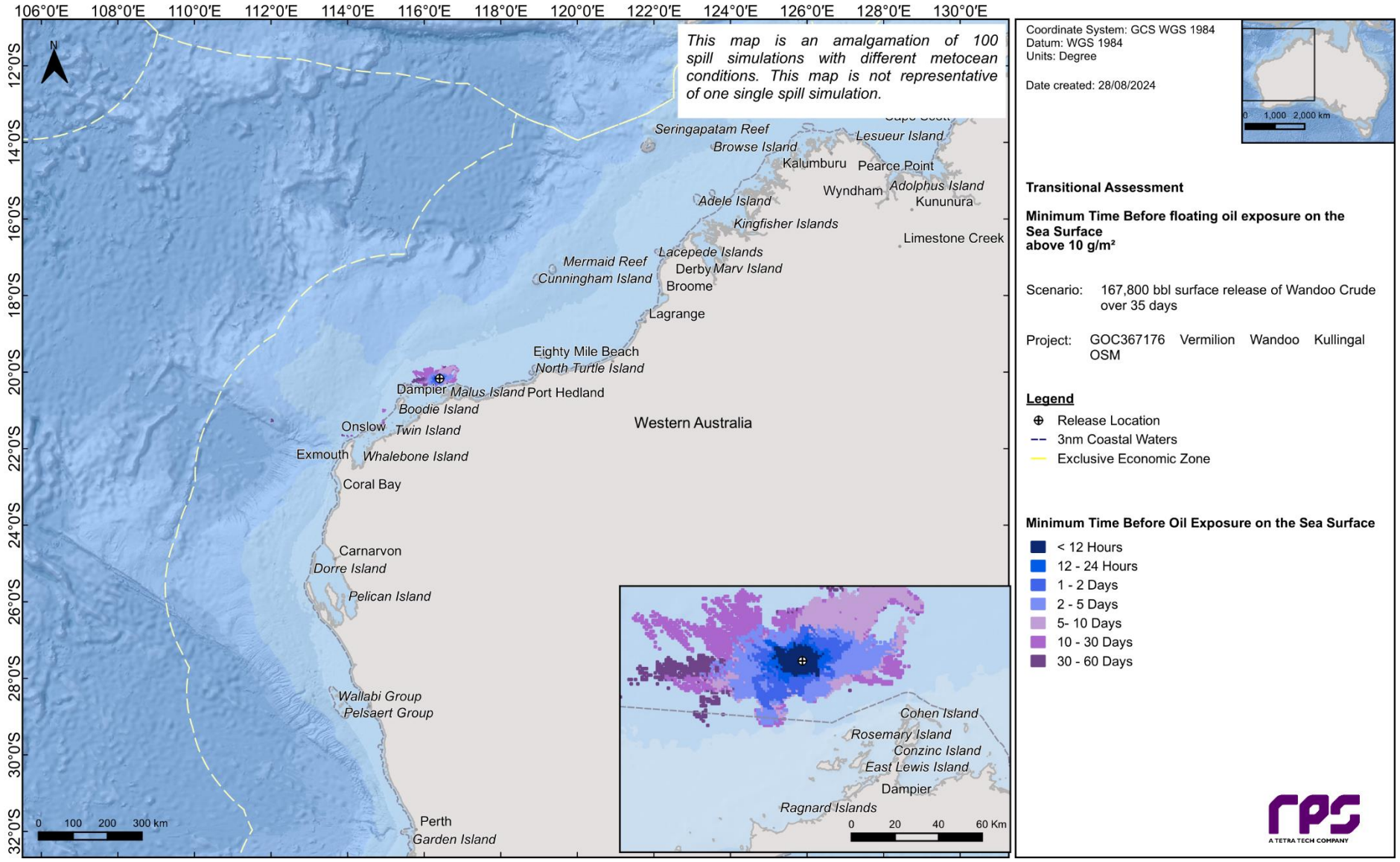

Figure 13.9 Minimum time before floating oil exposure at, or above, 10 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

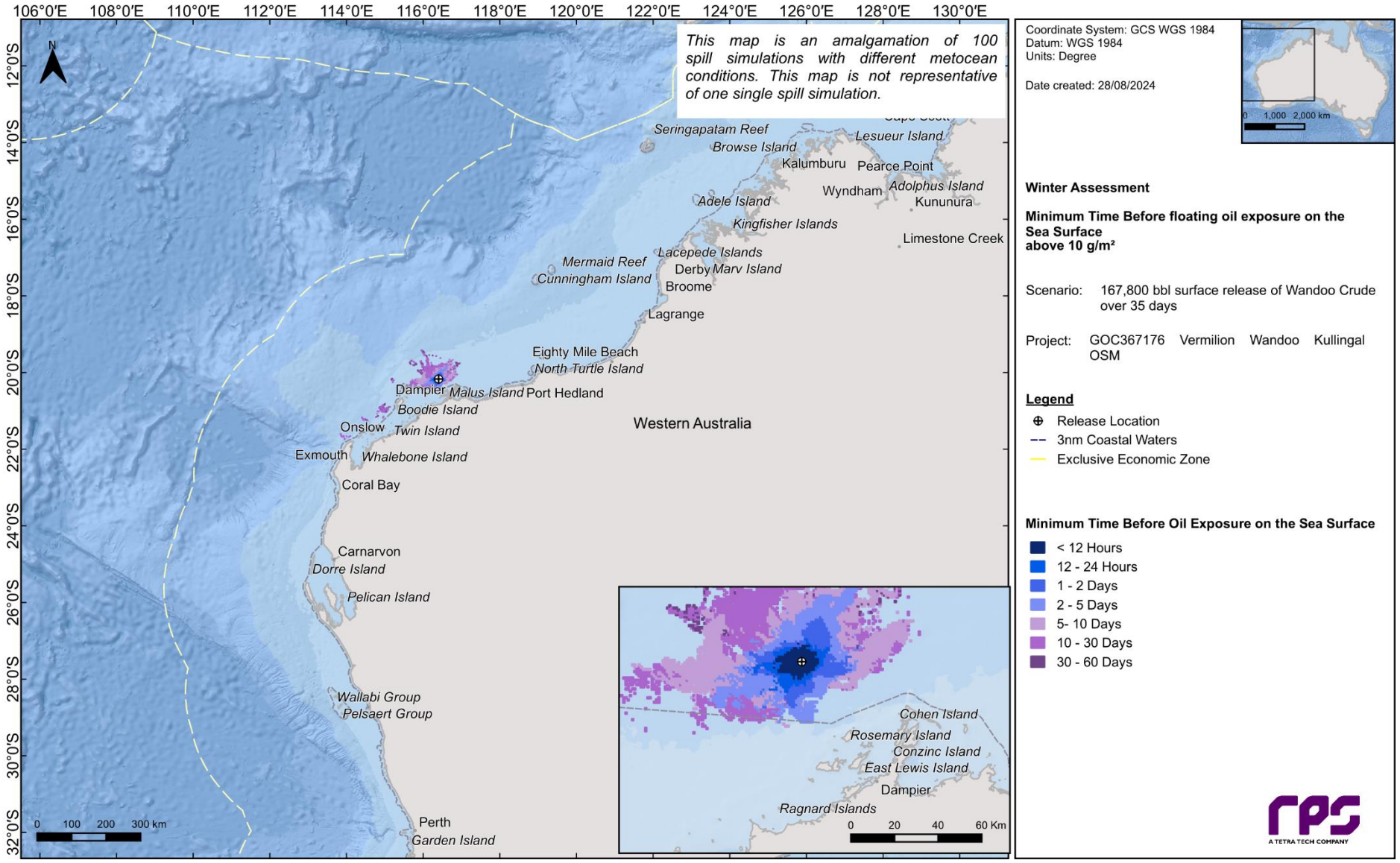

Figure 13.10 Minimum time before floating oil exposure at, or above, 10 g/m^2 following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

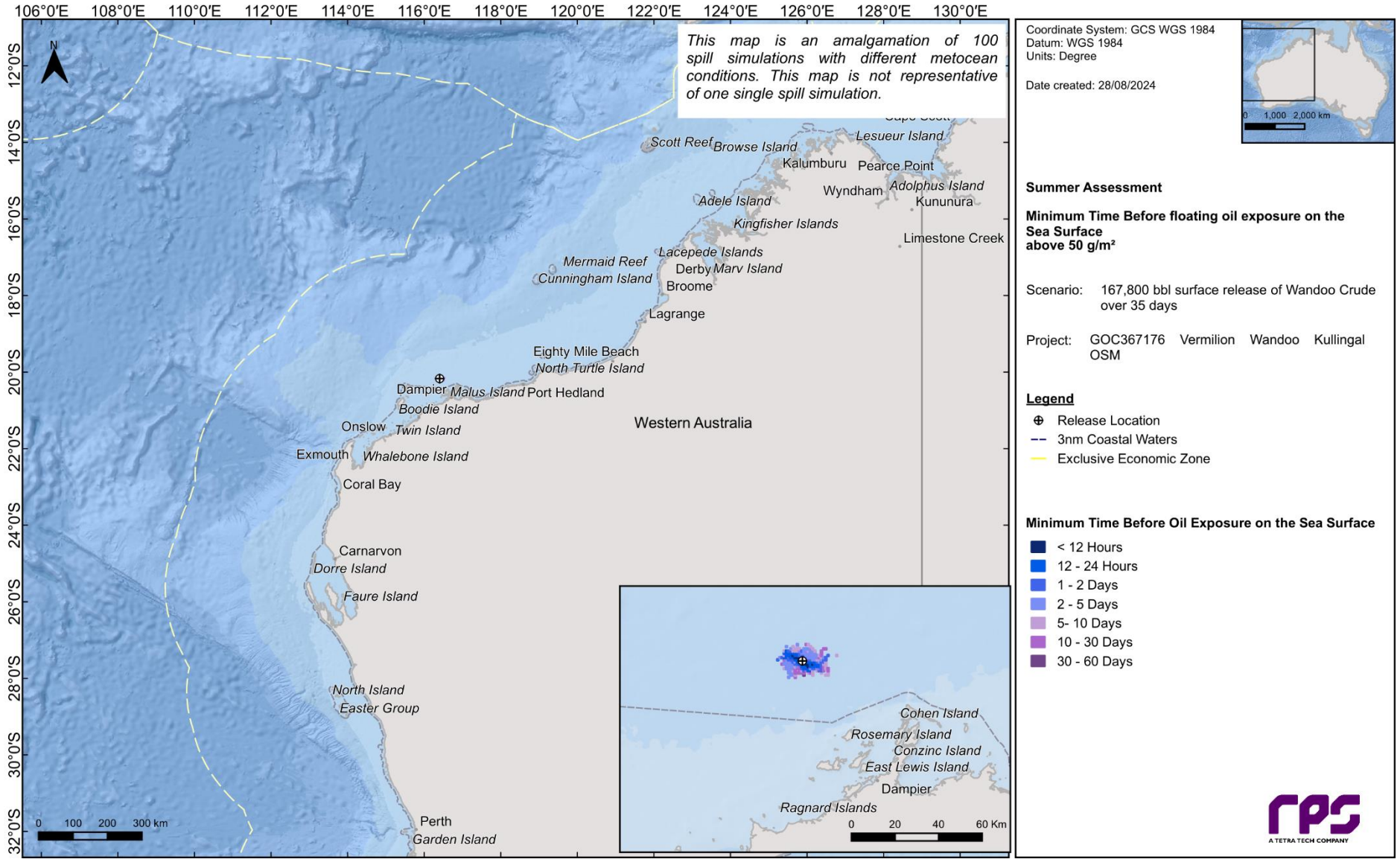

Figure 13.11 Minimum time before floating oil exposure at, or above, 50 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

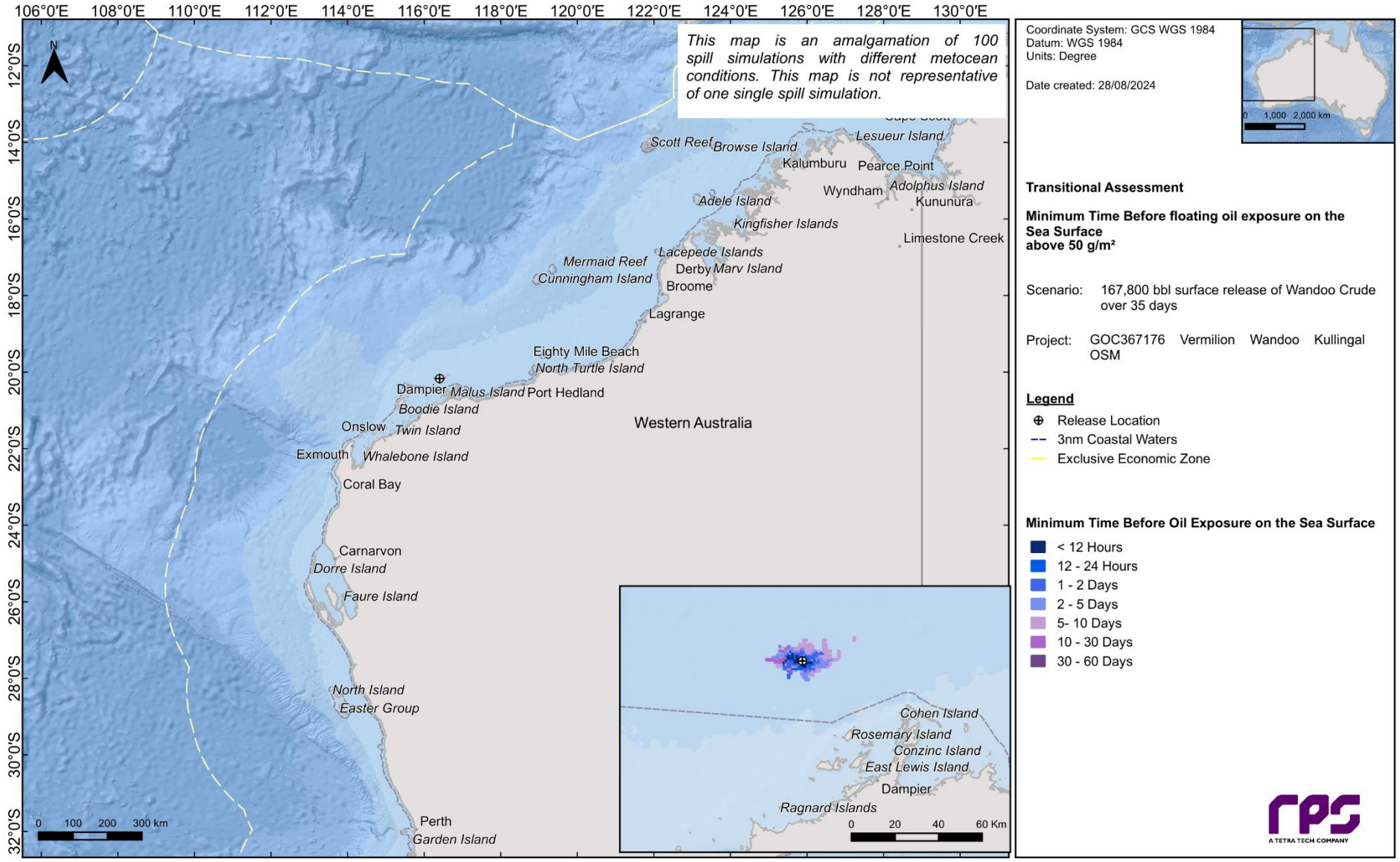

Figure 13.12 Minimum time before floating oil exposure at, or above, 50 g/m^2 following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

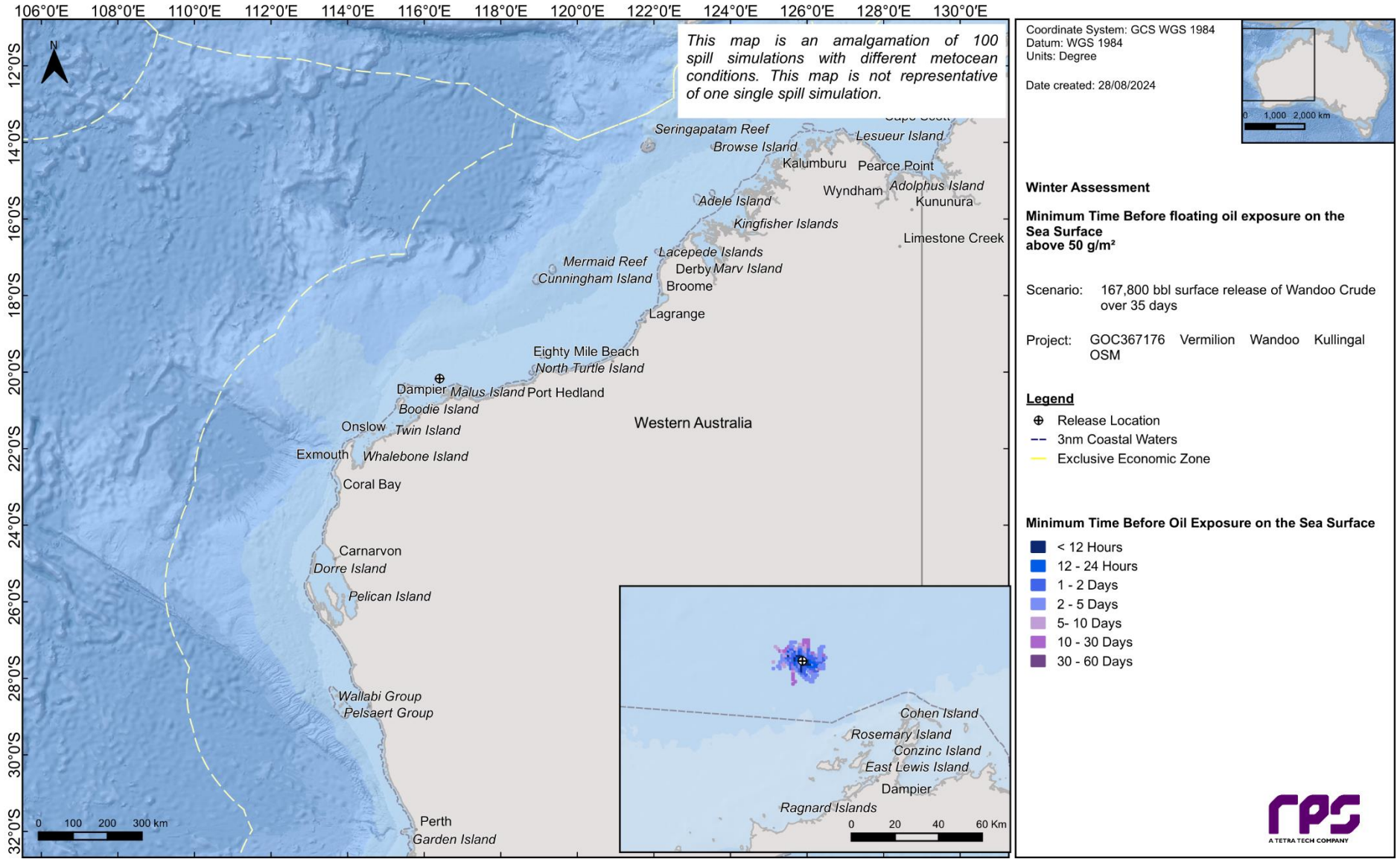

Figure 13.13 Minimum time before floating oil exposure at, or above, 50 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

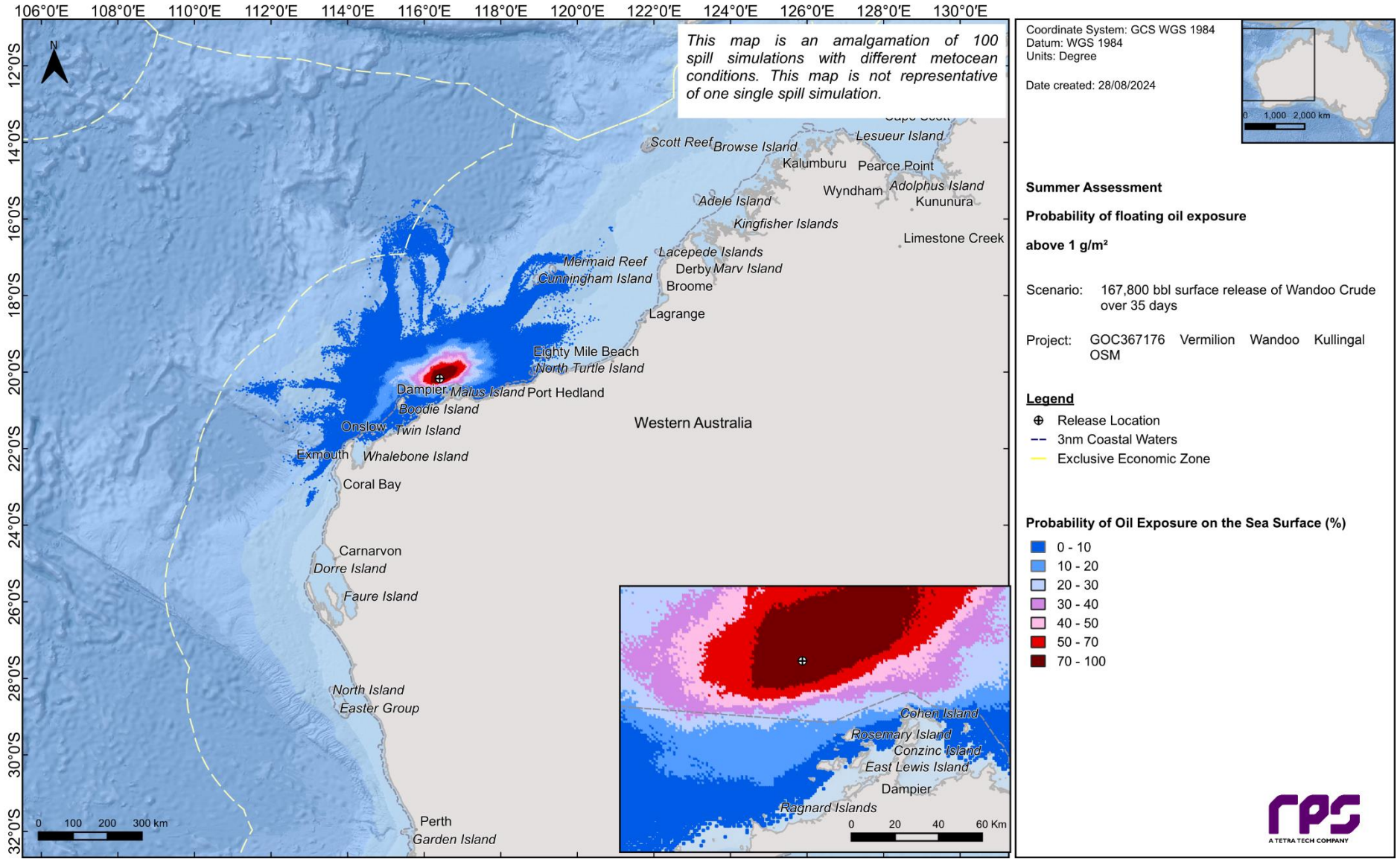

Figure 13.14 Probability of floating oil exposure at, or above, 1 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

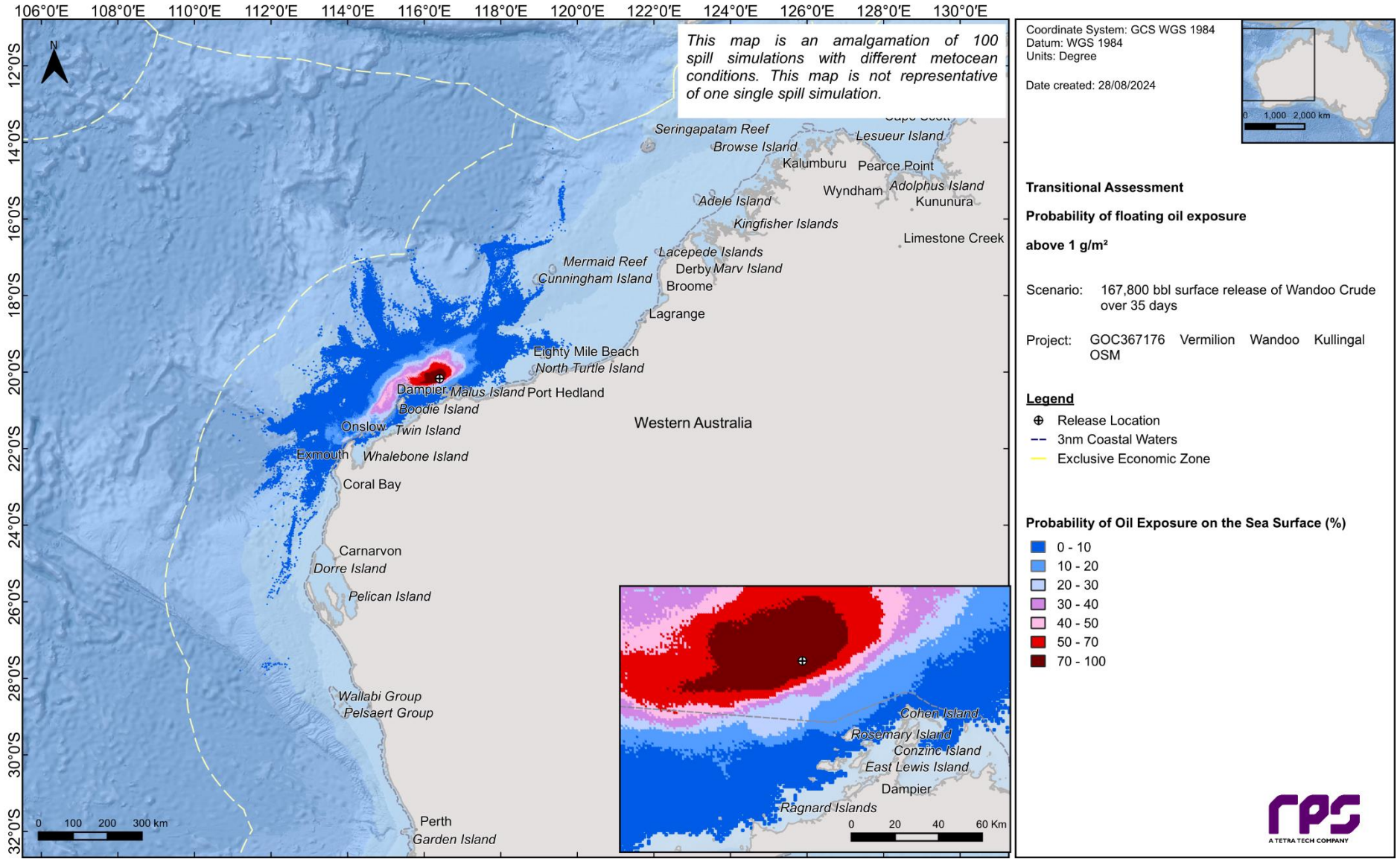

Figure 13.15 Probability of floating oil exposure at, or above, 1 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

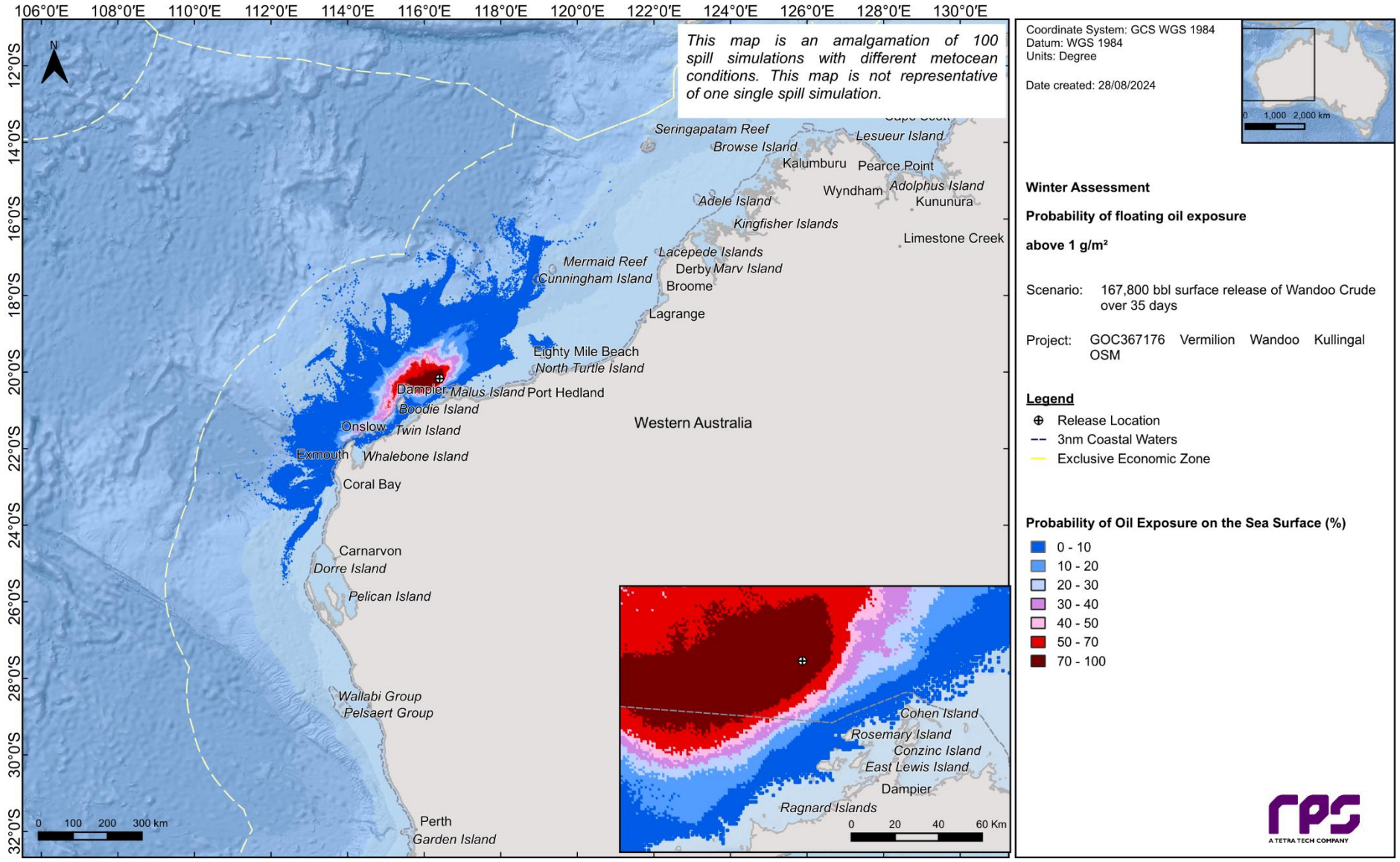

Figure 13.16 Probability of floating oil exposure at, or above, 1 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

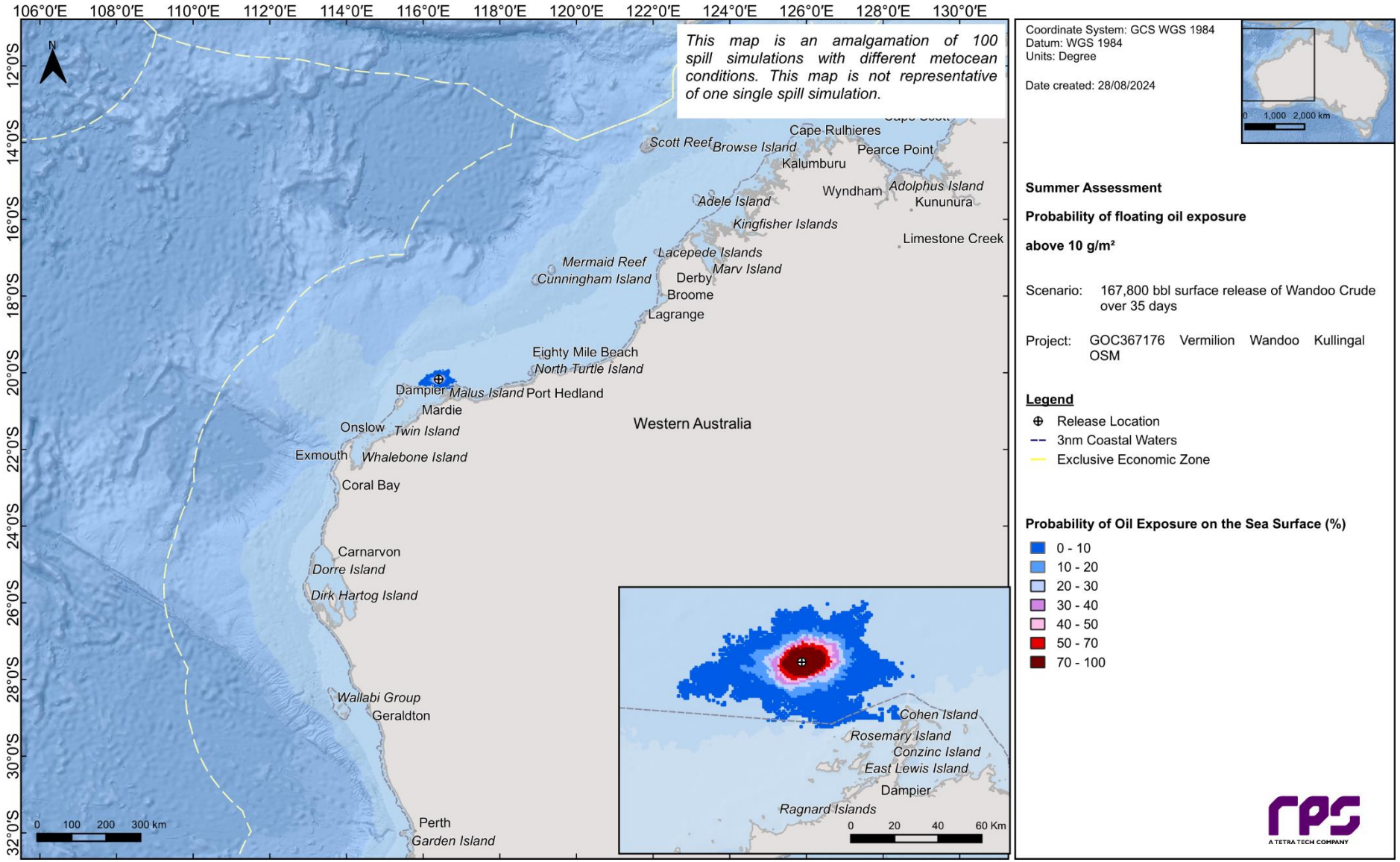

Figure 13.17 Probability of floating oil exposure at, or above, 10 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

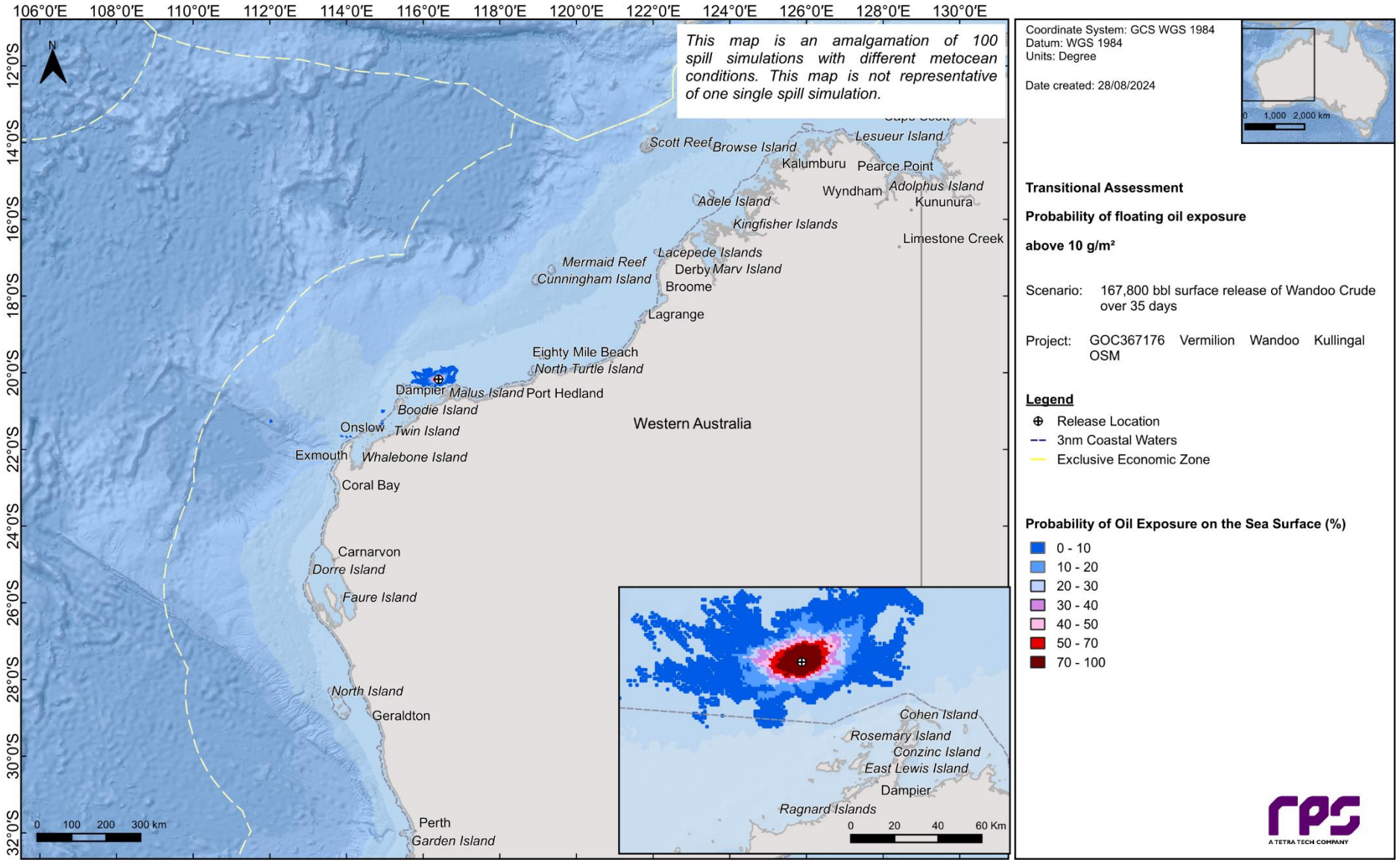

Figure 13.18 Probability of floating oil exposure at, or above, 10 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

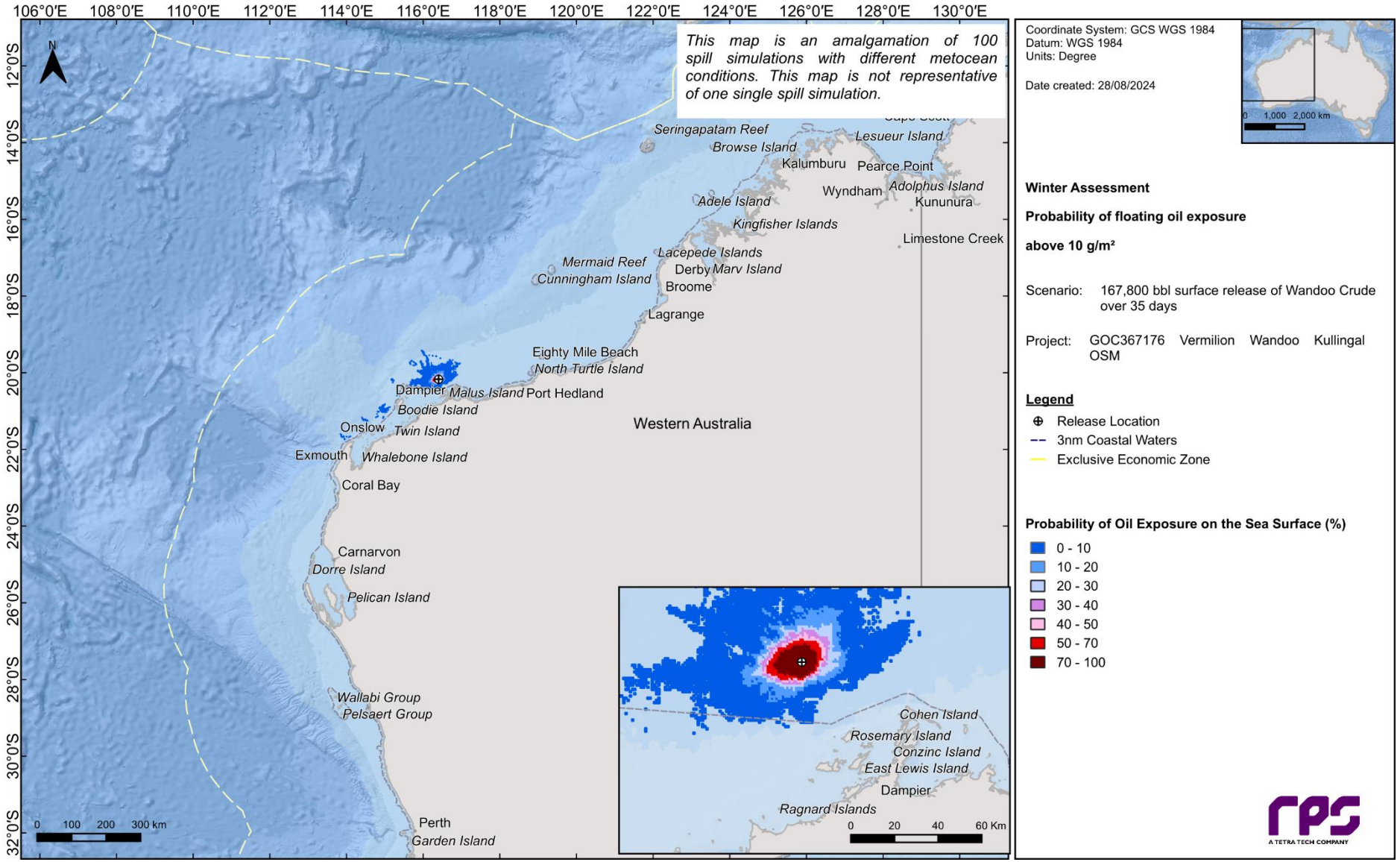

Figure 13.19 Probability of floating oil exposure at, or above, 10 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

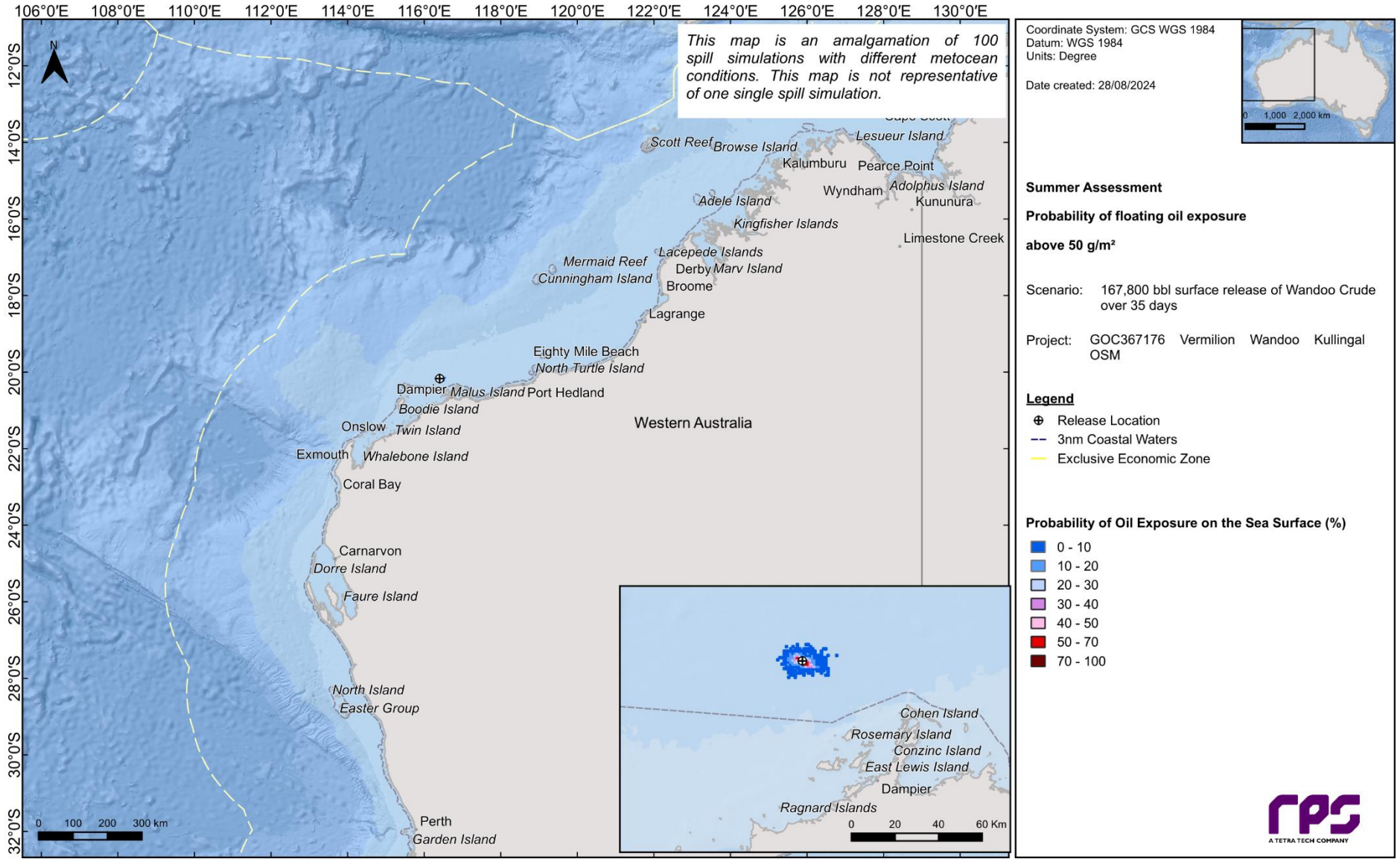

Figure 13.20 Probability of floating oil exposure at, or above, 50 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

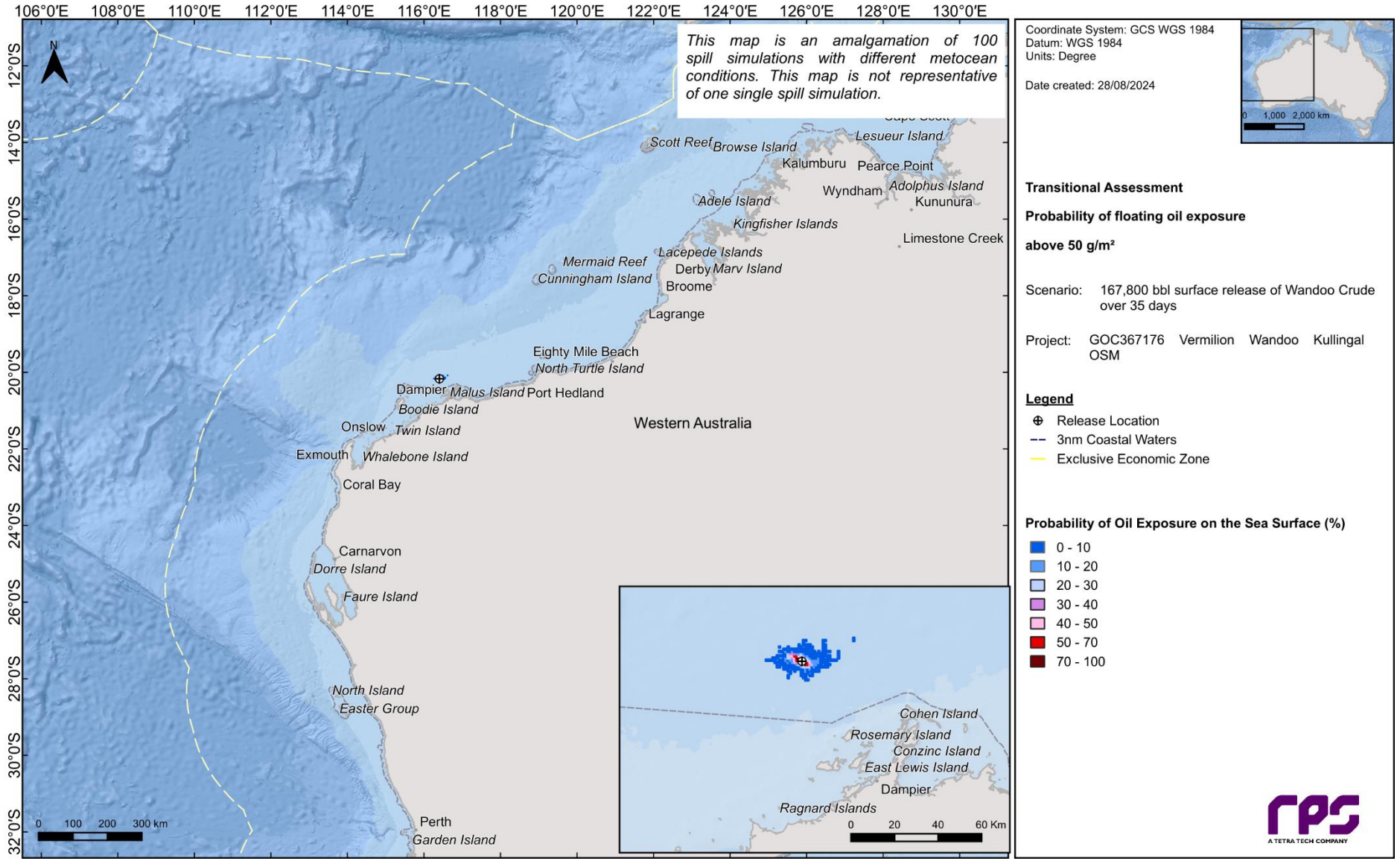

Figure 13.21 Probability of floating oil exposure at, or above, 50 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

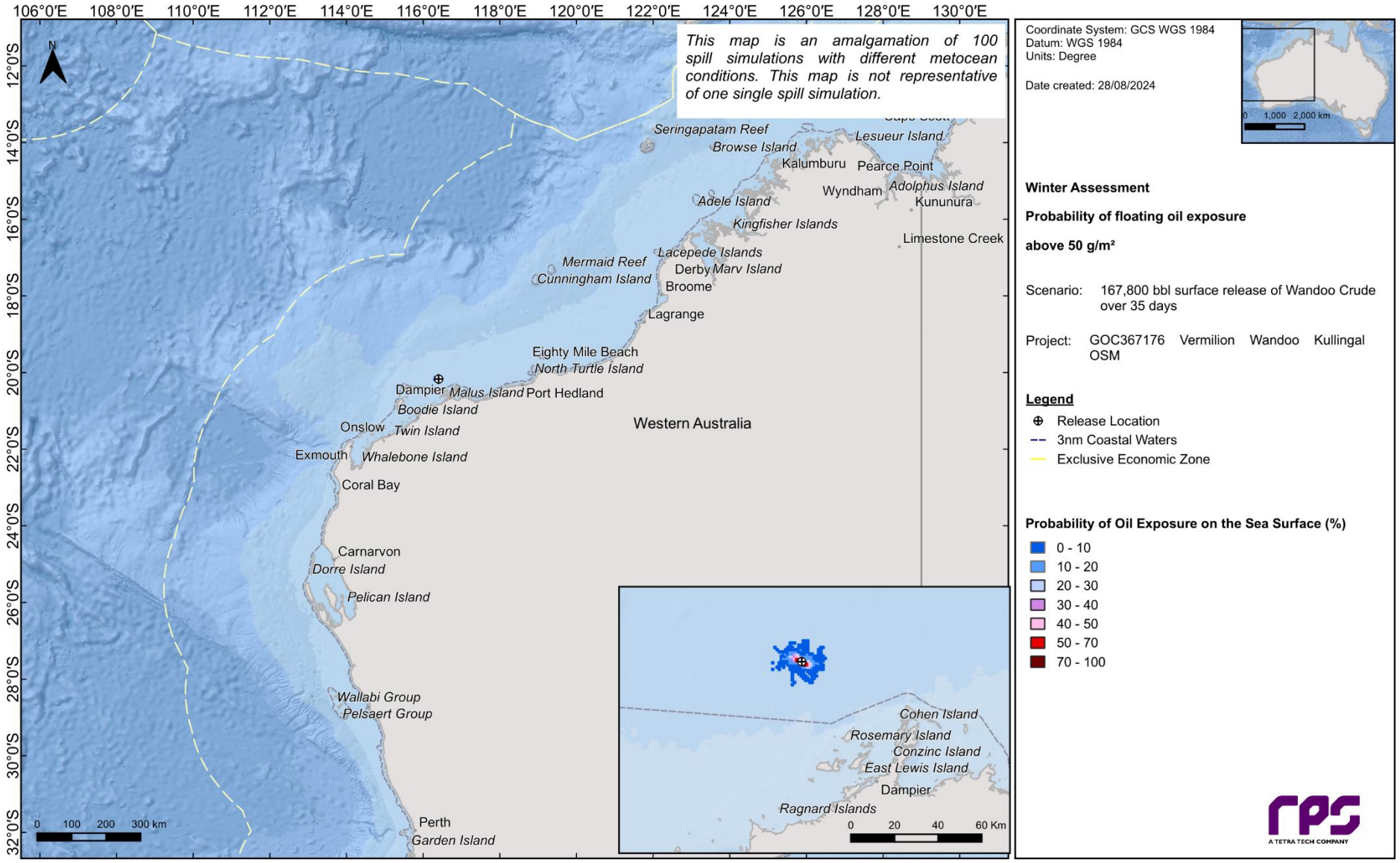

Figure 13.22 Probability of floating oil exposure at, or above, 50 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

13.1.3 Shoreline accumulation

Table 13.3 summarizes the predicted oil accumulation on shorelines across different seasons and thresholds. The highest probability of accumulation at, or above, the 10 g/m^2 threshold was recorded during winter, reaching 100%. The shortest time for oil to accumulate on any shoreline at this threshold was 69 hours, also during winter. The maximum volume of oil ashore from a single spill was 4,550.0 m^3, occurring during the summer season.

Table 13.4 to Table 13.6 present the predicted oil accumulation for specific shoreline cells for each season.

The highest probability of shoreline oil accumulation at, or above, the 10 g/m^2 threshold for a specific shoreline cell was forecast for WA11.West (318) - Barrow Island and Montebello Islands (A), with probabilities of 51%, 61%, and 92% during the summer, transitional, and winter seasons, respectively. During summer conditions, WA11.East (316) - West Intercourse Island - Dolphin Island North Point (F) shoreline cell recorded the fastest oil accumulation at 78 hours. During the transitional (85 hours) and winter (69 hours) conditions, WA11.West (318) - Barrow Island and Montebello Islands (A) recorded the quickest time for oil accumulation at, or above, the 10 g/m^2 threshold. Additionally, WA11.West (318) - Barrow Island and Montebello Islands (A) registered the highest volume of oil ashore across all shoreline cells, with 2,570 m^3, during a spill simulation that commenced under transitional conditions (see Table 13.5).

The maximum potential shoreline oil accumulation for each season are presented in Figure 13.23 to Figure 13.25. Probabilities of oil accumulation for each of the thresholds and seasons are presented in Figure 13.26 to Figure 13.34.

Table 13.3 Summary of oil accumulation on any shoreline following a surface LOWC at Kullingal. Results were calculated from 100 spill simulations per season.

Shoreline statistics	Summer			Transitional			Winter		
	Shoreline accumulation thresholds			Shoreline accumulation thresholds			Shoreline accumulation thresholds		
	10 g/m^2	100 g/m^2	1000 g/m^2	10 g/m^2	100 g/m^2	1,000 g/m^2	10 g/m^2	100 g/m^2	1,000 g/m^2
Probability of contact to any shoreline (%)	93	79	56	87	75	57	100	99	82
Absolute minimum time to shore (hours)	78	93	158	85	108	167	69	78	111
Maximum accumulated volume (m^3) from a single spill simulation	4,550.0	4,431.1	3,474.1	3,670.2	3,589.5	3,179.4	3,637.2	3,579.2	2,972.3
Average accumulated volume (m^3) across all spill simulations	719.9	668.5	400.0	719.0	688.6	516.3	1208.6	1170.0	901.7
Maximum length of shoreline (km) from a single spill simulation	1,320.0	588.0	122.0	524.0	268.0	102.0	518.0	248.0	85.0
Average length of shoreline (km) across all spill simulations	248.4	97.2	17.3	166.5	65.2	17.0	224.6	105.8	30.0

Table 13.4 Summary of shoreline oil accumulation on WAMOPRA shoreline cells following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

WAMOPRA shoreline cells	Probability (%) of shoreline oil on receptors at			Minimum time to receptor (hours) for shoreline oil at			Maximum local accumulated concentration (g/m²)		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 10 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 100 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 1,000 g/m²		Maximum length of shoreline (km) with concentrations ≥ 10 g/m²		Maximum length of shoreline (km) with concentrations ≥ 100 g/m²		Maximum length of shoreline (km) with concentrations ≥ 1,000 g/m²	
	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	averaged over all replicate spills	in the worst replicate spill	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation
WA06 (199) - Wreck Point - Guilderton	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA07 (195) - Thirsty Point - Booker Valley	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA08 (332) - Bowes River - Broken Anchor Bay (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA08 (333) - Bowes River - Broken Anchor Bay (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA08 (334) - Glenfield Beach - Bowes River (A)	1	NC	NC	1,284	NC	NC	0.1	12	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA08 (335) - Glenfield Beach - Bowes River (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA08 (336) - Glenfield Beach - Bowes River (C)	1	NC	NC	1,263	NC	NC	0.1	12	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA09 (169) - Cape Inscription - Herald Bay N (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (170) - Steep Point - Quoin Head (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (171) - Steep Point - Quoin Head (C)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (172) - Steep Point - Quoin Head (D)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (173) - Steep Point - Quoin Head (E)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (174) - Kakura Dunes coast - Zuytdorp Point (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (175) - Kakura Dunes coast - Zuytdorp Point (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (176) - Kakura Dunes coast - Zuytdorp Point (C)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (177) - Kakura Dunes coast - Zuytdorp Point (D)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (178) - Nunginjay Spring coast N - Kakura Dunes coast (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (330) - Dorre Island and Bernier Island (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (331) - Dorre Island and Bernier Island (B)	1	NC	NC	1,219	NC	NC	0.1	14	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA10 (120) - Bundegi - Shothole Canyon N (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA10 (121) - Bundegi - Shothole Canyon N (B)	1	NC	NC	1,188	NC	NC	0.1	14	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA10 (122) - Vlamingh Head - North West Cape	10	3	NC	462	932	NC	12	362	<1	9	<1	7	NC	NC	<1	9	<1	3	NC	NC
WA10 (123) - Low Point - Vlamingh Head (A)	11	4	NC	445	933	NC	8.8	275	<1	17	<1	15	NC	NC	2	15	<1	10	NC	NC
WA10 (124) - Low Point - Vlamingh Head (B)	11	4	NC	919	933	NC	17	636	2	50	2	47	NC	NC	2	19	<1	13	NC	NC
WA10 (125) - Osprey Bay - Low Point	5	4	NC	691	933	NC	15	540	2	51	2	50	NC	NC	<1	16	<1	15	NC	NC
WA10 (126) - Winderabandi Point - Osprey Bay	5	3	NC	651	929	NC	16	659	<1	27	<1	22	NC	NC	<1	18	<1	10	NC	NC
WA10 (127) - Coast Hill - Point Cloates	5	3	NC	813	979	NC	7.3	309	<1	22	<1	18	NC	NC	<1	16	<1	10	NC	NC
WA10 (128) - Point Maud - Coast Hill (A)	3	2	NC	1,047	1,196	NC	4.2	221	<1	5	<1	3	NC	NC	<1	11	<1	1	NC	NC
WA10 (130) - Alison Point - Point Maud	3	NC	NC	1,086	NC	NC	0.6	36	<1	<1	NC	NC	NC	NC	<1	5	NC	NC	NC	NC
WA10 (132) - Gnarraloo Bay - Alison Point (B)	1	NC	NC	1,271	NC	NC	0.1	13	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA10 (133) - Red Bluff - Gnarraloo Bay (A)	3	NC	NC	1,066	NC	NC	0.4	25	<1	<1	NC	NC	NC	NC	<1	5	NC	NC	NC	NC
WA10 (134) - Red Bluff - Gnarraloo Bay (B)	3	NC	NC	1,037	NC	NC	0.6	25	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA10 (135) - Red Bluff - Gnarraloo Bay (C)	2	NC	NC	1,182	NC	NC	0.3	25	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA10 (136) - Point Quobba - Cape Cuvier (A)	1	NC	NC	1,171	NC	NC	0.1	13	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA11.East (100) - Sherlock coast - Cape Cossigny (B)	20	10	3	409	525	710	84	2,988	7	262	6	260	3	146	4	36	1	31	<1	8
WA11.East (101) - Cape Lambert - Sherlock coast (A)	12	4	2	497	548	1,221	34	1,475	3	89	2	82	<1	29	2	42	<1	25	<1	2
WA11.East (102) - Cape Lambert - Sherlock coast (B)	26	13	3	337	525	694	153	5,573	5	160	5	153	3	131	3	26	<1	14	<1	5
WA11.East (103) - West Intercourse Island - Dolphin Island N point (A)	4	NC	NC	584	NC	NC	1.4	67	<1	2	NC	NC	NC	NC	<1	10	NC	NC	NC	NC

WA11.East (104) - West Intercourse Island - Dolphin Island N point (B)	32	15	4	214	288	652	126	3,379	5	107	4	104	2	73	4	25	<1	11	<1	3
WA11.East (105) - West Intercourse Island - Dolphin Island N point (C)	43	35	27	110	165	204	1,148	18,921	72	1,331	71	1,328	54	1,270	12	45	7	36	2	25
WA11.East (106) - West Intercourse Island - Dolphin Island N point (D)	16	5	NC	196	711	NC	13	264	<1	12	<1	6	NC	NC	3	25	<1	4	NC	NC
WA11.East (107) - West Intercourse Island - Dolphin Island N point (E)	10	4	NC	165	876	NC	6.6	142	<1	12	<1	5	NC	NC	2	22	<1	4	NC	NC
WA11.East (108) - Pelican Point - West Intercourse Island	19	10	4	126	563	737	104	1,963	6	107	5	101	<1	32	4	45	2	21	<1	2
WA11.East (109) - James Point - Cape Preston	18	14	9	318	487	576	159	2,127	8	125	7	116	4	61	4	40	2	24	<1	3
WA11.East (315) - Dolphin Island N point - Cinders Rd coast	34	22	5	215	230	288	315	7,435	10	223	9	222	6	210	3	12	2	10	<1	7
WA11.East (316) - West Intercourse Island - Dolphin Island N point (F)	39	30	21	78	93	158	829	12,152	54	737	52	728	41	638	12	63	5	43	2	17
WA11.East (317) - West Intercourse Island - Dolphin Island N point (G)	34	29	21	84	130	158	1,151	12,791	37	465	35	458	26	358	9	48	4	35	<1	11
WA11.East (95) - Turner River NE foreland - Beebingara Creek coast E (A)	39	21	8	424	470	756	194	2,614	12	154	11	150	4	95	8	28	3	20	<1	5
WA11.East (96) - Turner River NE foreland - Beebingara Creek coast E (B)	35	25	9	395	413	649	203	2,372	12	141	11	136	4	74	7	29	3	18	<1	4
WA11.East (97) - Cape Thouin - Turner River NE foreland	33	25	10	377	399	496	253	2,968	29	304	28	302	16	264	7	29	5	22	<1	16
WA11.East (98) - Cape Cossigny - Cape Thouin	26	20	3	378	400	502	145	3,512	16	381	15	376	9	326	6	30	3	22	<1	15
WA11.East (99) - Sherlock coast - Cape Cossigny (A)	23	15	3	377	449	684	135	3,624	14	383	12	377	8	288	6	55	2	35	<1	14
WA11.West (110) - Mount Salt coast W - James Point	16	11	5	284	499	570	79	1,992	12	319	11	315	5	190	4	48	2	40	<1	12
WA11.West (111) - Peter Creek coast E - Mount Salt coast W	17	10	3	301	326	949	118	3,649	12	398	11	389	7	286	4	55	2	40	<1	13
WA11.West (112) - Weld Island coast S - Peter Creek coast E	6	4	3	307	627	1,055	52	1,859	5	159	5	146	2	54	3	52	<1	30	<1	4
WA11.West (113) - Coolgra Point W - Yardie Landing (A)	6	4	2	299	833	1,050	35	1,219	2	43	2	40	<1	13	<1	14	<1	8	<1	1
WA11.West (114) - Coolgra Point W - Yardie Landing (B)	6	3	NC	596	1,009	NC	23	794	<1	26	<1	21	NC	NC	<1	22	<1	8	NC	NC
WA11.West (115) - Hope Point - Locker Point (A)	11	9	1	565	575	782	57	1,504	2	64	2	60	<1	41	2	31	<1	6	<1	3
WA11.West (116) - Hope Point - Locker Point (B)	6	2	NC	585	1,055	NC	4.9	184	<1	15	<1	8	NC	NC	<1	20	<1	5	NC	NC
WA11.West (117) - Hope Point - Locker Point (C)	3	NC	NC	1,014	NC	NC	1.8	68	<1	3	NC	NC	NC	NC	<1	11	NC	NC	NC	NC
WA11.West (318) - Barrow Island and Montebello Islands (A)	51	38	22	84	115	401	1,330	20,212	161	1,388	157	1,382	124	1,339	23	67	13	59	4	34
WA11.West (319) - Barrow Island and Montebello Islands (B)	46	33	8	142	204	801	311	4,969	26	382	25	382	17	368	5	15	3	15	<1	14
WA11.West (320) - Barrow Island and Montebello Islands (C)	33	21	5	169	196	660	113	1,664	19	240	17	232	5	152	10	56	4	34	<1	11
WA11.West (321) - Barrow Island and Montebello Islands (D)	40	22	10	173	194	398	188	2,320	20	271	18	269	7	167	9	44	4	33	<1	10
WA11.West (323) - Yardie Landing - Weld Island coast S (A)	13	6	3	275	314	941	138	5,904	7	240	7	240	6	240	<1	7	<1	7	<1	7
WA11.West (324) - Yardie Landing - Weld Island coast S (B)	17	13	4	195	219	805	85	2,055	3	59	3	59	2	59	<1	3	<1	3	<1	3
WA11.West (325) - Coolgra Point W - Yardie Landing (C)	16	11	3	193	499	764	76	1,984	5	103	5	103	<1	47	2	14	2	14	<1	3
WA11.West (326) - Baresand Point - Entrance Point E	27	17	6	406	487	541	203	6,645	18	345	17	342	9	295	4	24	3	23	<1	12
WA11.West (327) - Hope Point - Locker Point (E)	11	8	NC	552	584	NC	33	755	<1	13	<1	13	NC	NC	<1	2	<1	2	NC	NC
WA11.West (328) - Hope Point - Locker Point (F)	9	5	NC	564	580	NC	21	495	<1	22	<1	21	NC	NC	<1	13	<1	9	NC	NC
WA11.West (329) - Locker Point - Baresand Point	25	13	4	376	401	740	92	2,768	11	257	10	253	4	209	5	30	2	23	<1	12
WA12 (308) - Red Bluff - Chimney Rocks (B)	2	NC	NC	1,263	NC	NC	0.3	22	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA12 (309) - Mermaid Reef	11	5	1	804	881	953	72	5,454	2	111	2	111	2	111	<1	2	<1	2	<1	2
WA12 (310) - Clerke Reef	14	5	NC	722	787	NC	23	641	2	30	<1	27	NC	NC	<1	11	<1	6	NC	NC
WA12 (311) - Imperieuse Reef	22	9	3	621	665	826	75	2,553	6	163	5	161	3	143	3	19	<1	16	<1	10
WA12 (312) - Yan Well coast - Condini Landing (C)	39	31	15	433	455	587	277	3,197	7	72	7	72	4	62	2	4	<1	4	<1	2

WA12 (313) - Wattle Well coast - Yan Well coast (C)	43	32	14	445	469	564	371	4,256	10	100	9	100	6	100	2	4	2	4	<1	4
WA12 (314) - Wattle Well coast - Yan Well coast (D)	42	37	18	426	469	520	733	8,861	8	92	8	92	7	92	<1	1	<1	1	<1	1
WA12 (69) - Red Bluff - Chimney Rocks (A)	1	NC	NC	1,227	NC	NC	0.1	12	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA12 (70) - Coulomb Point - Red Bluff (A)	2	NC	NC	1,302	NC	NC	0.2	12	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA12 (72) - Cape Boileau - Coulomb Point (A)	1	NC	NC	1,298	NC	NC	0.1	12	<1	<1	NC	NC	NC	NC	<1	4	NC	NC	NC	NC
WA12 (73) - Cape Boileau - Coulomb Point (B)	1	NC	NC	1,298	NC	NC	0.1	12	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA12 (75) - Cape Gourdon - Cape Villaret (A)	2	NC	NC	1,245	NC	NC	0.4	33	<1	<1	NC	NC	NC	NC	<1	5	NC	NC	NC	NC
WA12 (76) - Cape Gourdon - Cape Villaret (B)	2	NC	NC	1,127	NC	NC	0.9	87	<1	4	NC	NC	NC	NC	<1	9	NC	NC	NC	NC
WA12 (77) - Saddle Hill - Cape Gourdon (A)	2	NC	NC	1,105	NC	NC	1.1	98	<1	4	NC	NC	NC	NC	<1	8	NC	NC	NC	NC
WA12 (78) - Saddle Hill - Cape Gourdon (B)	3	2	NC	1,067	1,312	NC	2.3	131	<1	12	<1	7	NC	NC	<1	16	<1	5	NC	NC
WA12 (79) - Tryon Point - False Cape Bossut (A)	2	2	NC	1,046	1,201	NC	4.2	265	<1	18	<1	12	NC	NC	<1	28	<1	6	NC	NC
WA12 (80) - Tryon Point - False Cape Bossut (B)	3	2	NC	979	1,235	NC	5	404	<1	27	<1	22	NC	NC	<1	21	<1	12	NC	NC
WA12 (81) - Cape Jaubert - Tryon Point	4	2	NC	878	1,108	NC	4	273	<1	22	<1	18	NC	NC	<1	14	<1	9	NC	NC
WA12 (82) - Samphire bore coast - Cape Jaubert (A)	5	2	NC	921	1,115	NC	5.1	274	<1	12	<1	12	NC	NC	<1	5	<1	5	NC	NC
WA12 (83) - Samphire bore coast - Cape Jaubert (B)	6	2	NC	895	1,031	NC	7	327	<1	19	<1	18	NC	NC	<1	9	<1	8	NC	NC
WA12 (84) - Samphire bore coast - Cape Jaubert (C)	11	3	NC	793	909	NC	9.5	451	2	49	<1	47	NC	NC	2	23	<1	18	NC	NC
WA12 (85) - Cooraidegel Well coast - Eighty Mile Beach Caravan Park NE (A)	17	6	NC	684	853	NC	17	541	2	34	<1	33	NC	NC	2	10	<1	9	NC	NC
WA12 (86) - Cooraidegel Well coast - Eighty Mile Beach Caravan Park NE (B)	17	10	NC	679	773	NC	26	619	3	48	2	47	NC	NC	3	16	<1	14	NC	NC
WA12 (87) - Cooraidegel Well coast - Eighty Mile Beach Caravan Park NE (C)	17	11	NC	633	746	NC	28	569	3	40	2	39	NC	NC	3	14	<1	14	NC	NC
WA12 (88) - Shoonta Well - Cooraidegel Well coast	21	15	NC	563	631	NC	89	976	7	70	6	67	NC	NC	5	25	2	22	NC	NC
WA12 (89) - Condini Landing - Mulla Mulla Creek	27	17	1	508	609	1,195	91	1,834	9	210	8	205	2	114	7	44	3	31	<1	8
WA12 (90) - Yan Well coast - Condini Landing (A)	27	15	1	493	615	1,077	62	2,105	4	106	3	106	<1	65	3	13	<1	13	<1	4
WA12 (91) - Yan Well coast - Condini Landing (B)	37	26	10	422	506	603	279	3,552	21	283	20	280	9	189	9	39	4	28	<1	9
WA12 (92) - Wattle Well coast - Yan Well coast (A)	37	25	10	434	531	885	217	2,500	20	228	19	228	11	189	6	19	3	16	<1	10
WA12 (93) - Wattle Well coast - Yan Well coast (B)	37	23	9	462	514	835	219	2,984	29	326	27	323	14	242	10	34	5	25	<1	12
WA12 (94) - Beebingara Creek coast E - Wattle Well coast	38	28	8	439	533	811	196	2,392	14	156	12	154	4	77	9	34	3	24	<1	4
WA13 (305) - Seringapatam Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA13 (306) - Scott Reef North	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA13 (307) - Scott Reef South	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Table 13.5 Summary of shoreline oil accumulation on WAMOPRA shoreline cells following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

WAMOPRA shoreline cells	Probability (%) of shoreline oil on receptors at			Minimum time to receptor (hours) for shoreline oil at			Maximum local accumulated concentration (g/m²)		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 10 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 100 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 1,000 g/m²		Maximum length of shoreline (km) with concentrations ≥ 10 g/m²		Maximum length of shoreline (km) with concentrations ≥ 100 g/m²		Maximum length of shoreline (km) with concentrations ≥ 1,000 g/m²	
	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	averaged over all replicate spills	in the worst replicate spill	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation
WA06 (199) - Wreck Point - Guilderton	1	NC	NC	1,253	NC	NC	0.1	14	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA07 (195) - Thirsty Point - Booker Valley	1	NC	NC	1,322	NC	NC	0.1	13	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA08 (332) - Bowes River - Broken Anchor Bay (A)	6	1	NC	1,167	1,315	NC	2.6	107	<1	2	<1	2	NC	NC	<1	5	<1	1	NC	NC
WA08 (333) - Bowes River - Broken Anchor Bay (B)	6	NC	NC	1,179	NC	NC	2.3	97	<1	6	NC	NC	NC	NC	<1	22	NC	NC	NC	NC
WA08 (334) - Glenfield Beach - Bowes River (A)	7	NC	NC	1,170	NC	NC	2.1	62	<1	5	NC	NC	NC	NC	<1	16	NC	NC	NC	NC
WA08 (335) - Glenfield Beach - Bowes River (B)	6	NC	NC	1,191	NC	NC	2.5	82	<1	3	NC	NC	NC	NC	<1	6	NC	NC	NC	NC
WA08 (336) - Glenfield Beach - Bowes River (C)	5	NC	NC	1,174	NC	NC	1.2	49	<1	3	NC	NC	NC	NC	<1	11	NC	NC	NC	NC
WA09 (169) - Cape Inscription - Herald Bay N (B)	3	NC	NC	869	NC	NC	0.7	34	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA09 (170) - Steep Point - Quoin Head (B)	9	NC	NC	847	NC	NC	2.9	59	<1	4	NC	NC	NC	NC	<1	13	NC	NC	NC	NC
WA09 (171) - Steep Point - Quoin Head (C)	6	NC	NC	860	NC	NC	2.2	70	<1	4	NC	NC	NC	NC	<1	12	NC	NC	NC	NC
WA09 (172) - Steep Point - Quoin Head (D)	6	NC	NC	980	NC	NC	3.2	85	<1	6	NC	NC	NC	NC	<1	10	NC	NC	NC	NC
WA09 (173) - Steep Point - Quoin Head (E)	7	2	NC	1,116	1,198	NC	4.8	152	<1	11	<1	2	NC	NC	2	20	<1	1	NC	NC
WA09 (174) - Kakura Dunes coast - Zuytdorp Point (A)	5	NC	NC	1,139	NC	NC	1.8	82	<1	4	NC	NC	NC	NC	<1	11	NC	NC	NC	NC
WA09 (175) - Kakura Dunes coast - Zuytdorp Point (B)	3	NC	NC	1,200	NC	NC	0.6	25	<1	<1	NC	NC	NC	NC	<1	6	NC	NC	NC	NC
WA09 (176) - Kakura Dunes coast - Zuytdorp Point (C)	4	NC	NC	1,222	NC	NC	0.6	25	<1	<1	NC	NC	NC	NC	<1	5	NC	NC	NC	NC
WA09 (177) - Kakura Dunes coast - Zuytdorp Point (D)	3	NC	NC	1,138	NC	NC	0.4	14	<1	<1	NC	NC	NC	NC	<1	4	NC	NC	NC	NC
WA09 (178) - Nunginjay Spring coast N - Kakura Dunes coast (A)	1	NC	NC	1,230	NC	NC	0.2	24	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA09 (330) - Dorre Island and Bernier Island (A)	5	NC	NC	851	NC	NC	0.9	61	<1	3	NC	NC	NC	NC	<1	19	NC	NC	NC	NC
WA09 (331) - Dorre Island and Bernier Island (B)	11	1	NC	862	967	NC	3.3	132	<1	10	<1	2	NC	NC	3	40	<1	1	NC	NC
WA10 (120) - Bundegi - Shothole Canyon N (A)	3	NC	NC	1,045	NC	NC	0.4	15	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA10 (121) - Bundegi - Shothole Canyon N (B)	36	12	NC	461	742	NC	50	956	<1	16	<1	15	NC	NC	2	10	<1	4	NC	NC
WA10 (122) - Vlamingh Head - North West Cape	45	33	4	400	437	777	199	2,927	9	101	8	101	3	96	4	9	2	9	<1	6
WA10 (123) - Low Point - Vlamingh Head (A)	37	20	3	491	593	788	69	1,238	6	74	5	74	<1	13	5	15	2	14	<1	1
WA10 (124) - Low Point - Vlamingh Head (B)	36	15	2	499	507	1,031	63	2,029	7	186	6	186	2	113	5	19	2	19	<1	8
WA10 (125) - Osprey Bay - Low Point	22	8	NC	588	801	NC	16	677	2	25	<1	23	NC	NC	3	15	<1	10	NC	NC
WA10 (126) - Winderabandi Point - Osprey Bay	22	4	NC	637	982	NC	12	171	<1	10	<1	5	NC	NC	3	15	<1	3	NC	NC
WA10 (127) - Coast Hill - Point Cloates	20	7	NC	727	1,014	NC	15	195	<1	5	<1	4	NC	NC	<1	10	<1	2	NC	NC
WA10 (128) - Point Maud - Coast Hill (A)	4	1	NC	1,142	1,335	NC	1.8	121	<1	5	<1	2	NC	NC	<1	11	<1	1	NC	NC
WA10 (130) - Alison Point - Point Maud	2	NC	NC	1,297	NC	NC	0.5	25	<1	2	NC	NC	NC	NC	<1	8	NC	NC	NC	NC
WA10 (132) - Gnarraloo Bay - Alison Point (B)	3	NC	NC	1,222	NC	NC	0.4	25	<1	<1	NC	NC	NC	NC	<1	5	NC	NC	NC	NC
WA10 (133) - Red Bluff - Gnarraloo Bay (A)	5	NC	NC	1,115	NC	NC	0.8	35	<1	2	NC	NC	NC	NC	<1	7	NC	NC	NC	NC

WA10 (134) - Red Bluff - Gnarraloo Bay (B)	5	NC	NC	1,169	NC	NC	0.7	36	<1	<1	NC	NC	NC	NC	<1	4	NC	NC	NC	NC
WA10 (135) - Red Bluff - Gnarraloo Bay (C)	5	NC	NC	1,142	NC	NC	0.9	40	<1	2	NC	NC	NC	NC	<1	9	NC	NC	NC	NC
WA10 (136) - Point Quobba - Cape Cuvier (A)	1	NC	NC	1,245	NC	NC	0.1	13	<1	<1	NC	NC	NC	NC	<1	4	NC	NC	NC	NC
WA11.East (100) - Sherlock coast - Cape Cossigny (B)	2	NC	NC	1,222	NC	NC	0.6	42	<1	2	NC	NC	NC	NC	<1	4	NC	NC	NC	NC
WA11.East (101) - Cape Lambert - Sherlock coast (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA11.East (102) - Cape Lambert - Sherlock coast (B)	3	NC	NC	581	NC	NC	0.4	32	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA11.East (103) - West Intercourse Island - Dolphin Island N point (A)	1	1	NC	1,191	1,203	NC	3.2	321	<1	6	<1	5	NC	NC	<1	5	<1	2	NC	NC
WA11.East (104) - West Intercourse Island - Dolphin Island N point (B)	13	3	NC	451	589	NC	9.1	525	<1	38	<1	32	NC	NC	<1	27	<1	12	NC	NC
WA11.East (105) - West Intercourse Island - Dolphin Island N point (C)	23	18	10	196	404	485	283	4,547	13	183	12	177	7	119	5	37	2	22	<1	5
WA11.East (106) - West Intercourse Island - Dolphin Island N point (D)	5	3	NC	557	765	NC	4.7	150	<1	7	<1	6	NC	NC	<1	11	<1	4	NC	NC
WA11.East (107) - West Intercourse Island - Dolphin Island N point (E)	4	NC	NC	716	NC	NC	1.2	48	<1	3	NC	NC	NC	NC	<1	8	NC	NC	NC	NC
WA11.East (108) - Pelican Point - West Intercourse Island	6	2	1	475	484	517	19	1,592	2	112	2	105	<1	40	<1	40	<1	21	<1	3
WA11.East (109) - James Point - Cape Preston	8	5	1	401	426	627	30	2,189	2	68	<1	66	<1	44	<1	18	<1	7	<1	2
WA11.East (315) - Dolphin Island N point - Cinders Rd coast	15	6	NC	381	418	NC	30	817	<1	17	<1	15	NC	NC	<1	9	<1	4	NC	NC
WA11.East (316) - West Intercourse Island - Dolphin Island N point (F)	22	17	7	251	376	611	346	5,954	23	421	22	412	17	364	5	57	3	32	<1	10
WA11.East (317) - West Intercourse Island - Dolphin Island N point (G)	22	19	7	327	374	589	563	10,808	19	414	19	410	15	345	4	43	2	30	<1	10
WA11.East (95) - Turner River NE foreland - Beebingara Creek coast E (A)	4	2	NC	1,176	1,234	NC	11	579	<1	38	<1	33	NC	NC	<1	26	<1	11	NC	NC
WA11.East (96) - Turner River NE foreland - Beebingara Creek coast E (B)	6	2	NC	1,157	1,202	NC	16	830	<1	50	<1	48	NC	NC	<1	22	<1	15	NC	NC
WA11.East (97) - Cape Thouin - Turner River NE foreland	6	2	1	858	1,172	1,296	20	1,099	3	118	2	117	<1	23	<1	26	<1	21	<1	2
WA11.East (98) - Cape Cossigny - Cape Thouin	5	2	NC	656	1,178	NC	9.4	492	<1	42	<1	39	NC	NC	<1	24	<1	17	NC	NC
WA11.East (99) - Sherlock coast - Cape Cossigny (A)	3	2	NC	642	1,232	NC	2.2	128	<1	9	<1	3	NC	NC	<1	20	<1	2	NC	NC
WA11.West (110) - Mount Salt coast W - James Point	6	2	NC	427	1,013	NC	3	139	<1	9	<1	3	NC	NC	<1	24	<1	2	NC	NC
WA11.West (111) - Peter Creek coast E - Mount Salt coast W	11	3	NC	623	906	NC	7.1	221	<1	11	<1	6	NC	NC	<1	18	<1	3	NC	NC
WA11.West (112) - Weld Island coast S - Peter Creek coast E	3	1	NC	623	903	NC	2.3	104	<1	5	<1	2	NC	NC	<1	13	<1	1	NC	NC
WA11.West (113) - Coolgra Point W - Yardie Landing (A)	4	NC	NC	690	NC	NC	2.4	89	<1	2	NC	NC	NC	NC	<1	4	NC	NC	NC	NC
WA11.West (114) - Coolgra Point W - Yardie Landing (B)	6	3	NC	649	776	NC	7.1	235	<1	4	<1	3	NC	NC	<1	5	<1	1	NC	NC
WA11.West (115) - Hope Point - Locker Point (A)	24	13	NC	458	602	NC	38	585	<1	6	<1	6	NC	NC	<1	11	<1	2	NC	NC
WA11.West (116) - Hope Point - Locker Point (B)	3	NC	NC	896	NC	NC	0.9	57	<1	<1	NC	NC	NC	NC	<1	4	NC	NC	NC	NC
WA11.West (117) - Hope Point - Locker Point (C)	4	1	NC	907	1,340	NC	2.1	151	<1	5	<1	2	NC	NC	<1	12	<1	1	NC	NC
WA11.West (318) - Barrow Island and Montebello Islands (A)	61	56	47	85	108	167	3,597	22,688	335	2,570	331	2,565	287	2,493	28	65	18	56	7	31
WA11.West (319) - Barrow Island and Montebello Islands (B)	49	41	21	116	137	202	641	5,979	32	343	32	343	17	338	7	15	5	15	<1	14
WA11.West (320) - Barrow Island and Montebello Islands (C)	39	18	5	137	176	513	88	1,774	17	251	14	248	3	73	13	56	4	40	<1	6
WA11.West (321) - Barrow Island and Montebello Islands (D)	46	35	7	141	174	379	248	3,229	32	435	29	427	14	317	15	49	6	38	<1	17
WA11.West (323) - Yardie Landing - Weld Island coast S (A)	10	5	NC	604	641	NC	20	561	<1	12	<1	10	NC	NC	<1	7	<1	4	NC	NC
WA11.West (324) - Yardie Landing - Weld Island coast S (B)	28	15	2	205	229	772	91	1,644	3	48	3	48	<1	48	<1	3	<1	3	<1	3
WA11.West (325) - Coolgra Point W - Yardie Landing (C)	34	22	2	203	205	305	120	1,947	7	93	7	90	<1	57	4	14	2	13	<1	4

WA11.West (326) - Baresand Point - Entrance Point E	54	52	39	211	279	408	1,404	6,843	91	555	90	554	65	525	12	24	9	24	4	18
WA11.West (327) - Hope Point - Locker Point (E)	43	30	NC	290	493	NC	125	946	3	18	3	18	NC	NC	<1	2	<1	2	NC	NC
WA11.West (328) - Hope Point - Locker Point (F)	40	8	NC	326	776	NC	30	723	2	42	<1	41	NC	NC	2	13	<1	12	NC	NC
WA11.West (329) - Locker Point - Baresand Point	55	53	43	224	291	425	1,388	7,009	125	667	123	665	106	654	14	30	9	24	5	22
WA12 (308) - Red Bluff - Chimney Rocks (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (309) - Mermaid Reef	8	3	NC	1,082	1,159	NC	12	612	<1	11	<1	11	NC	NC	<1	2	<1	2	NC	NC
WA12 (310) - Clerke Reef	6	1	NC	656	1,017	NC	5.4	315	<1	10	<1	7	NC	NC	<1	8	<1	3	NC	NC
WA12 (311) - Imperieuse Reef	10	7	1	506	638	1,206	43	1,394	4	99	3	98	<1	51	2	19	<1	19	<1	4
WA12 (312) - Yan Well coast - Condini Landing (C)	9	4	NC	467	820	NC	12	339	<1	9	<1	9	NC	NC	<1	4	<1	4	NC	NC
WA12 (313) - Wattle Well coast - Yan Well coast (C)	6	1	NC	1,173	1,284	NC	2.5	168	<1	5	<1	4	NC	NC	<1	4	<1	2	NC	NC
WA12 (314) - Wattle Well coast - Yan Well coast (D)	6	2	NC	1,067	1,282	NC	5.2	191	<1	2	<1	2	NC	NC	<1	1	<1	1	NC	NC
WA12 (69) - Red Bluff - Chimney Rocks (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (70) - Coulomb Point - Red Bluff (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (72) - Cape Boileau - Coulomb Point (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (73) - Cape Boileau - Coulomb Point (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (75) - Cape Gourdon - Cape Villaret (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (76) - Cape Gourdon - Cape Villaret (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (77) - Saddle Hill - Cape Gourdon (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (78) - Saddle Hill - Cape Gourdon (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (79) - Tryon Point - False Cape Bossut (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (80) - Tryon Point - False Cape Bossut (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (81) - Cape Jaubert - Tryon Point	1	NC	NC	1,187	NC	NC	0.3	35	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA12 (82) - Samphire bore coast - Cape Jaubert (A)	3	NC	NC	1,180	NC	NC	0.7	46	<1	<1	NC	NC	NC	NC	<1	4	NC	NC	NC	NC
WA12 (83) - Samphire bore coast - Cape Jaubert (B)	3	1	NC	1,178	1,333	NC	2.2	114	<1	4	<1	2	NC	NC	<1	8	<1	1	NC	NC
WA12 (84) - Samphire bore coast - Cape Jaubert (C)	4	2	NC	1,088	1,254	NC	3.6	216	<1	21	<1	14	NC	NC	<1	22	<1	9	NC	NC
WA12 (85) - Cooraidegel Well coast - Eighty Mile Beach Caravan Park NE (A)	4	1	NC	904	1,320	NC	2.4	103	<1	5	<1	2	NC	NC	<1	10	<1	1	NC	NC
WA12 (86) - Cooraidegel Well coast - Eighty Mile Beach Caravan Park NE (B)	4	NC	NC	889	NC	NC	1.1	58	<1	4	NC	NC	NC	NC	<1	12	NC	NC	NC	NC
WA12 (87) - Cooraidegel Well coast - Eighty Mile Beach Caravan Park NE (C)	2	NC	NC	858	NC	NC	0.4	24	<1	<1	NC	NC	NC	NC	<1	5	NC	NC	NC	NC
WA12 (88) - Shoonta Well - Cooraidegel Well coast	2	NC	NC	883	NC	NC	0.2	15	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA12 (89) - Condini Landing - Mulla Mulla Creek	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (90) - Yan Well coast - Condini Landing (A)	1	NC	NC	750	NC	NC	0.2	17	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA12 (91) - Yan Well coast - Condini Landing (B)	2	NC	NC	1,022	NC	NC	0.3	23	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA12 (92) - Wattle Well coast - Yan Well coast (A)	2	NC	NC	1,225	NC	NC	0.3	24	<1	<1	NC	NC	NC	NC	<1	6	NC	NC	NC	NC
WA12 (93) - Wattle Well coast - Yan Well coast (B)	3	1	NC	1,167	1,320	NC	1.7	141	<1	7	<1	2	NC	NC	<1	19	<1	1	NC	NC
WA12 (94) - Beebingara Creek coast E - Wattle Well coast	4	2	NC	1,240	1,254	NC	6.3	538	<1	27	<1	21	NC	NC	<1	25	<1	8	NC	NC
WA13 (305) - Seringapatam Reef	2	NC	NC	1,295	NC	NC	0.3	35	<1	3	NC	NC	NC	NC	<1	11	NC	NC	NC	NC
WA13 (306) - Scott Reef North	3	NC	NC	1,290	NC	NC	0.6	35	<1	3	NC	NC	NC	NC	<1	12	NC	NC	NC	NC
WA13 (307) - Scott Reef South	2	NC	NC	1,199	NC	NC	0.8	46	<1	2	NC	NC	NC	NC	<1	7	NC	NC	NC	NC

Table 13.6 Summary of shoreline oil accumulation on WAMOPRA shoreline cells following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

WAMOPRA shoreline cells	Probability (%) of shoreline oil on receptors at			Minimum time to receptor (hours) for shoreline oil at			Maximum local accumulated concentration (g/m²)		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 10 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 100 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 1,000 g/m²		Maximum length of shoreline (km) with concentrations ≥ 10 g/m²		Maximum length of shoreline (km) with concentrations ≥ 100 g/m²		Maximum length of shoreline (km) with concentrations ≥ 1,000 g/m²	
	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	averaged over all replicate spills	in the worst replicate spill	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation
WA06 (199) - Wreck Point - Guilderton	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA07 (195) - Thirsty Point - Booker Valley	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA08 (332) - Bowes River - Broken Anchor Bay (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA08 (333) - Bowes River - Broken Anchor Bay (B)	2	NC	NC	1,081	NC	NC	0.3	14	<1	<1	NC	NC	NC	NC	<1	5	NC	NC	NC	NC
WA08 (334) - Glenfield Beach - Bowes River (A)	3	NC	NC	1,084	NC	NC	0.5	35	<1	2	NC	NC	NC	NC	<1	8	NC	NC	NC	NC
WA08 (335) - Glenfield Beach - Bowes River (B)	1	NC	NC	1,103	NC	NC	0.1	14	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA08 (336) - Glenfield Beach - Bowes River (C)	1	NC	NC	1,165	NC	NC	0.4	37	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA09 (169) - Cape Inscription - Herald Bay N (B)	1	NC	NC	1,327	NC	NC	0.1	13	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA09 (170) - Steep Point - Quoin Head (B)	1	NC	NC	1,208	NC	NC	0.1	13	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA09 (171) - Steep Point - Quoin Head (C)	2	NC	NC	1,080	NC	NC	0.2	14	<1	<1	NC	NC	NC	NC	<1	4	NC	NC	NC	NC
WA09 (172) - Steep Point - Quoin Head (D)	1	NC	NC	1,294	NC	NC	0.2	24	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA09 (173) - Steep Point - Quoin Head (E)	3	NC	NC	1,062	NC	NC	0.7	46	<1	<1	NC	NC	NC	NC	<1	6	NC	NC	NC	NC
WA09 (174) - Kakura Dunes coast - Zuytdorp Point (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (175) - Kakura Dunes coast - Zuytdorp Point (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (176) - Kakura Dunes coast - Zuytdorp Point (C)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (177) - Kakura Dunes coast - Zuytdorp Point (D)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (178) - Nunginjay Spring coast N - Kakura Dunes coast (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA09 (330) - Dorre Island and Bernier Island (A)	1	NC	NC	1,327	NC	NC	0.1	12	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA09 (331) - Dorre Island and Bernier Island (B)	2	NC	NC	918	NC	NC	0.3	23	<1	<1	NC	NC	NC	NC	<1	5	NC	NC	NC	NC
WA10 (120) - Bundegi - Shothole Canyon N (A)	8	1	NC	420	1,343	NC	2.3	104	<1	4	<1	2	NC	NC	<1	8	<1	1	NC	NC
WA10 (121) - Bundegi - Shothole Canyon N (B)	46	15	2	255	272	540	75	1,338	2	20	<1	17	<1	14	2	10	<1	4	<1	1
WA10 (122) - Vlamingh Head - North West Cape	59	45	5	238	249	413	283	3,476	10	110	9	109	3	107	5	9	3	9	<1	6
WA10 (123) - Low Point - Vlamingh Head (A)	45	16	1	242	295	877	56	1,177	4	71	3	71	<1	13	5	15	<1	14	<1	1
WA10 (124) - Low Point - Vlamingh Head (B)	48	13	3	293	357	607	92	2,706	9	211	8	211	4	160	7	19	2	19	<1	11
WA10 (125) - Osprey Bay - Low Point	26	5	NC	477	599	NC	20	551	2	26	<1	24	NC	NC	3	16	<1	11	NC	NC
WA10 (126) - Winderabandi Point - Osprey Bay	17	4	NC	477	609	NC	14	375	<1	19	<1	13	NC	NC	2	18	<1	6	NC	NC
WA10 (127) - Coast Hill - Point Cloates	14	3	NC	603	640	NC	7.5	251	<1	12	<1	7	NC	NC	<1	13	<1	4	NC	NC
WA10 (128) - Point Maud - Coast Hill (A)	3	NC	NC	781	NC	NC	1.1	83	<1	4	NC	NC	NC	NC	<1	8	NC	NC	NC	NC
WA10 (130) - Alison Point - Point Maud	1	NC	NC	845	NC	NC	0.1	15	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA10 (132) - Gnarraloo Bay - Alison Point (B)	2	NC	NC	849	NC	NC	0.3	15	<1	<1	NC	NC	NC	NC	<1	5	NC	NC	NC	NC
WA10 (133) - Red Bluff - Gnarraloo Bay (A)	2	NC	NC	797	NC	NC	0.7	41	<1	2	NC	NC	NC	NC	<1	7	NC	NC	NC	NC

WA10 (134) - Red Bluff - Gnarraloo Bay (B)	2	NC	NC	803	NC	NC	0.3	29	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA10 (135) - Red Bluff - Gnarraloo Bay (C)	1	NC	NC	890	NC	NC	0.4	42	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA10 (136) - Point Quobba - Cape Cuvier (A)	2	NC	NC	849	NC	NC	0.3	16	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA11.East (100) - Sherlock coast - Cape Cossigny (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA11.East (101) - Cape Lambert - Sherlock coast (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA11.East (102) - Cape Lambert - Sherlock coast (B)	1	NC	NC	1,198	NC	NC	0.2	25	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA11.East (103) - West Intercourse Island - Dolphin Island N point (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA11.East (104) - West Intercourse Island - Dolphin Island N point (B)	6	1	NC	633	1,197	NC	4	170	<1	5	<1	2	NC	NC	<1	9	<1	1	NC	NC
WA11.East (105) - West Intercourse Island - Dolphin Island N point (C)	13	6	2	409	483	1,168	46	1,078	3	56	2	50	<1	12	2	35	<1	16	<1	1
WA11.East (106) - West Intercourse Island - Dolphin Island N point (D)	1	NC	NC	1,318	NC	NC	0.6	64	<1	3	NC	NC	NC	NC	<1	7	NC	NC	NC	NC
WA11.East (107) - West Intercourse Island - Dolphin Island N point (E)	1	NC	NC	1,315	NC	NC	0.4	36	<1	2	NC	NC	NC	NC	<1	7	NC	NC	NC	NC
WA11.East (108) - Pelican Point - West Intercourse Island	17	1	NC	399	1,333	NC	6.9	113	<1	4	<1	2	NC	NC	<1	10	<1	1	NC	NC
WA11.East (109) - James Point - Cape Preston	28	17	6	184	206	393	99	1,478	3	26	2	24	<1	16	3	16	<1	4	<1	1
WA11.East (315) - Dolphin Island N point - Cinders Rd coast	4	2	NC	437	789	NC	4.3	188	<1	5	<1	2	NC	NC	<1	8	<1	1	NC	NC
WA11.East (316) - West Intercourse Island - Dolphin Island N point (F)	12	5	1	266	483	1,334	40	1,620	3	122	2	114	<1	73	2	37	<1	15	<1	5
WA11.East (317) - West Intercourse Island - Dolphin Island N point (G)	15	8	1	267	312	1,314	53	3,403	3	181	2	173	2	136	2	41	<1	22	<1	8
WA11.East (95) - Turner River NE foreland - Beebingara Creek coast E (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA11.East (96) - Turner River NE foreland - Beebingara Creek coast E (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA11.East (97) - Cape Thouin - Turner River NE foreland	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA11.East (98) - Cape Cossigny - Cape Thouin	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA11.East (99) - Sherlock coast - Cape Cossigny (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA11.West (110) - Mount Salt coast W - James Point	21	5	NC	293	424	NC	13	186	<1	7	<1	5	NC	NC	3	22	<1	3	NC	NC
WA11.West (111) - Peter Creek coast E - Mount Salt coast W	27	10	NC	417	566	NC	62	824	2	14	<1	13	NC	NC	2	19	<1	2	NC	NC
WA11.West (112) - Weld Island coast S - Peter Creek coast E	5	NC	NC	1,043	NC	NC	1.9	77	<1	4	NC	NC	NC	NC	<1	14	NC	NC	NC	NC
WA11.West (113) - Coolgra Point W - Yardie Landing (A)	10	1	NC	388	1,221	NC	4	137	<1	3	<1	2	NC	NC	<1	5	<1	1	NC	NC
WA11.West (114) - Coolgra Point W - Yardie Landing (B)	10	7	4	336	345	533	64	1,370	<1	15	<1	14	<1	14	<1	6	<1	1	<1	1
WA11.West (115) - Hope Point - Locker Point (A)	39	18	4	271	308	444	120	2,198	6	128	6	124	4	99	3	28	<1	16	<1	6
WA11.West (116) - Hope Point - Locker Point (B)	11	2	NC	292	665	NC	4.7	127	<1	4	<1	2	NC	NC	<1	12	<1	1	NC	NC
WA11.West (117) - Hope Point - Locker Point (C)	7	2	NC	543	853	NC	4.6	202	<1	9	<1	5	NC	NC	<1	17	<1	3	NC	NC
WA11.West (318) - Barrow Island and Montebello Islands (A)	92	88	75	69	78	111	7,498	22,738	683	2,377	676	2,371	611	2,319	49	65	33	53	15	31
WA11.West (319) - Barrow Island and Montebello Islands (B)	89	81	53	102	131	189	1,432	5,992	116	515	115	515	91	515	13	15	10	15	5	15
WA11.West (320) - Barrow Island and Montebello Islands (C)	79	60	6	127	222	557	321	2,380	53	213	47	208	7	99	29	53	13	39	<1	7
WA11.West (321) - Barrow Island and Montebello Islands (D)	78	64	14	116	120	318	380	3,010	65	327	59	323	20	216	30	51	14	40	2	15
WA11.West (323) - Yardie Landing - Weld Island coast S (A)	22	12	NC	557	668	NC	32	329	<1	9	<1	8	NC	NC	<1	7	<1	4	NC	NC
WA11.West (324) - Yardie Landing - Weld Island coast S (B)	57	35	7	288	296	335	280	3,514	8	94	8	94	5	94	2	3	<1	3	<1	3
WA11.West (325) - Coolgra Point W - Yardie Landing (C)	59	37	10	175	178	432	242	2,230	16	148	15	148	7	131	6	14	3	14	<1	8

WA11.West (326) - Baresand Point - Entrance Point E	76	70	54	174	175	244	1,648	8,305	102	682	100	681	64	644	16	24	12	24	4	16
WA11.West (327) - Hope Point - Locker Point (E)	61	46	2	236	274	846	179	1,141	4	21	4	21	<1	12	2	2	<1	2	<1	1
WA11.West (328) - Hope Point - Locker Point (F)	49	28	4	277	464	484	155	2,143	4	66	4	64	<1	22	3	13	<1	12	<1	1
WA11.West (329) - Locker Point - Baresand Point	74	68	52	200	214	323	1,836	10,168	141	608	138	601	114	591	19	30	12	25	5	14
WA12 (308) - Red Bluff - Chimney Rocks (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (309) - Mermaid Reef	6	2	NC	878	973	NC	5.6	302	<1	6	<1	6	NC	NC	<1	2	<1	2	NC	NC
WA12 (310) - Clerke Reef	20	4	NC	752	964	NC	11	170	<1	6	<1	2	NC	NC	2	10	<1	1	NC	NC
WA12 (311) - Imperieuse Reef	25	18	6	569	674	944	113	1,579	8	108	7	106	2	42	4	19	2	19	<1	3
WA12 (312) - Yan Well coast - Condini Landing (C)	3	NC	NC	1,185	NC	NC	0.7	45	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA12 (313) - Wattle Well coast - Yan Well coast (C)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (314) - Wattle Well coast - Yan Well coast (D)	2	NC	NC	1,269	NC	NC	0.2	13	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA12 (69) - Red Bluff - Chimney Rocks (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (70) - Coulomb Point - Red Bluff (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (72) - Cape Boileau - Coulomb Point (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (73) - Cape Boileau - Coulomb Point (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (75) - Cape Gourdon - Cape Villaret (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (76) - Cape Gourdon - Cape Villaret (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (77) - Saddle Hill - Cape Gourdon (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (78) - Saddle Hill - Cape Gourdon (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (79) - Tryon Point - False Cape Bossut (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (80) - Tryon Point - False Cape Bossut (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (81) - Cape Jaubert - Tryon Point	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (82) - Samphire bore coast - Cape Jaubert (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (83) - Samphire bore coast - Cape Jaubert (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (84) - Samphire bore coast - Cape Jaubert (C)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (85) - Cooraidegel Well coast - Eighty Mile Beach Caravan Park NE (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (86) - Cooraidegel Well coast - Eighty Mile Beach Caravan Park NE (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (87) - Cooraidegel Well coast - Eighty Mile Beach Caravan Park NE (C)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (88) - Shoonta Well - Cooraidegel Well coast	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (89) - Condini Landing - Mulla Mulla Creek	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (90) - Yan Well coast - Condini Landing (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (91) - Yan Well coast - Condini Landing (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (92) - Wattle Well coast - Yan Well coast (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (93) - Wattle Well coast - Yan Well coast (B)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA12 (94) - Beebingara Creek coast E - Wattle Well coast	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
WA13 (305) - Seringapatam Reef	1	NC	NC	1,328	NC	NC	0.1	12	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC
WA13 (306) - Scott Reef North	1	NC	NC	1,293	NC	NC	0.5	46	<1	4	NC	NC	NC	NC	<1	13	NC	NC	NC	NC
WA13 (307) - Scott Reef South	1	1	NC	1,262	1,329	NC	1	103	<1	10	<1	2	NC	NC	<1	30	<1	1	NC	NC

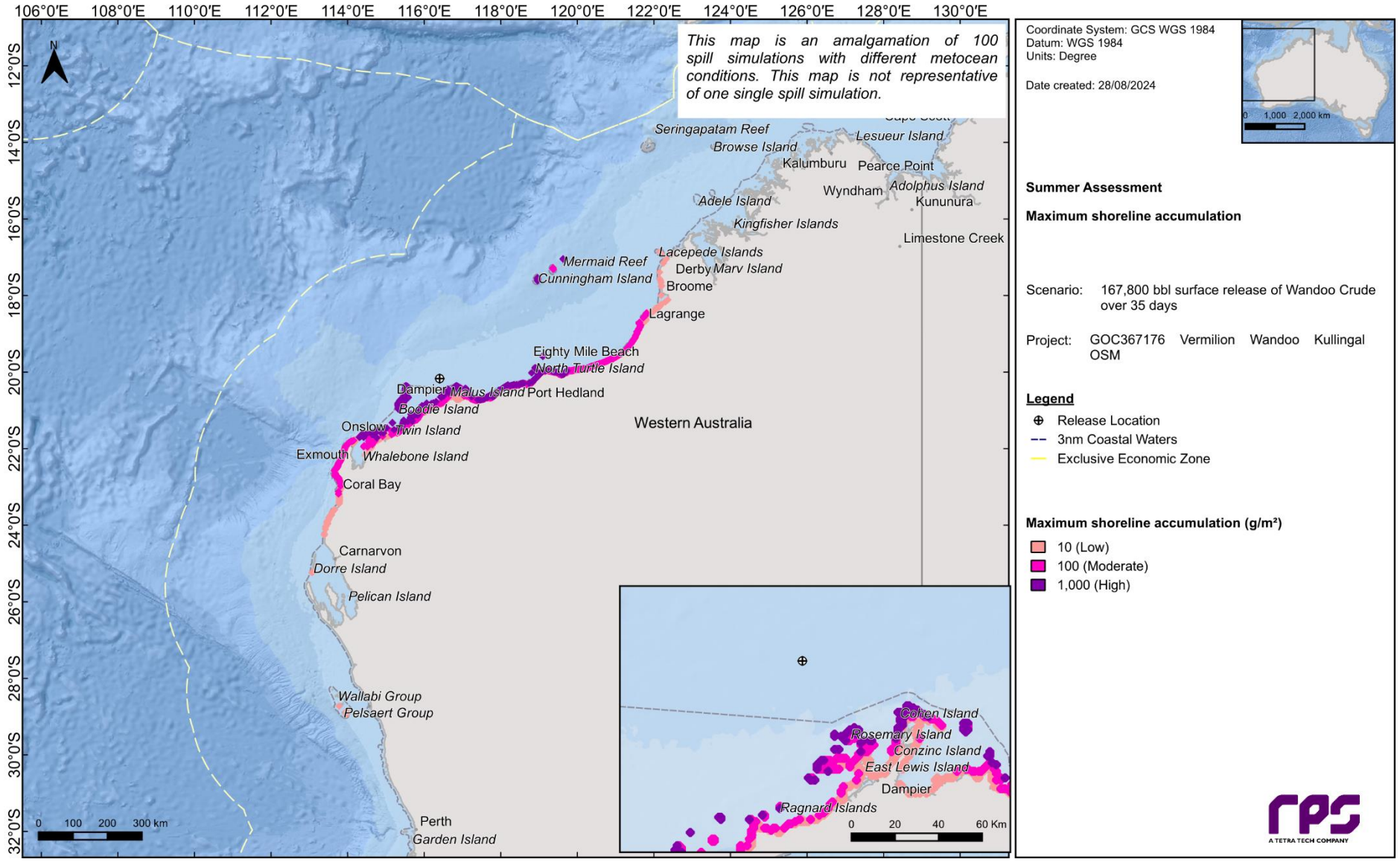

Figure 13.23 Maximum potential shoreline oil accumulation following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

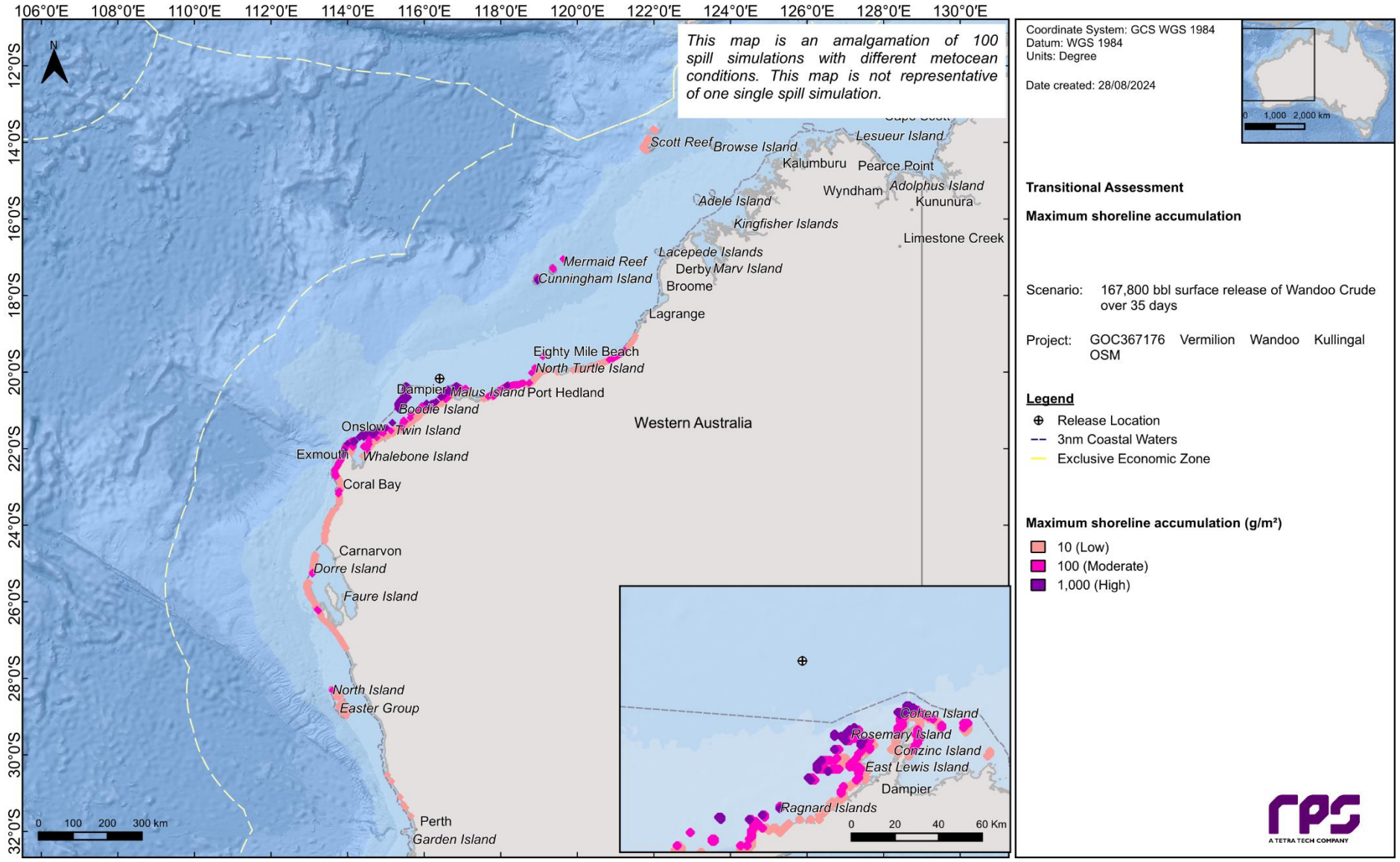

Figure 13.24 Maximum potential shoreline oil accumulation following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

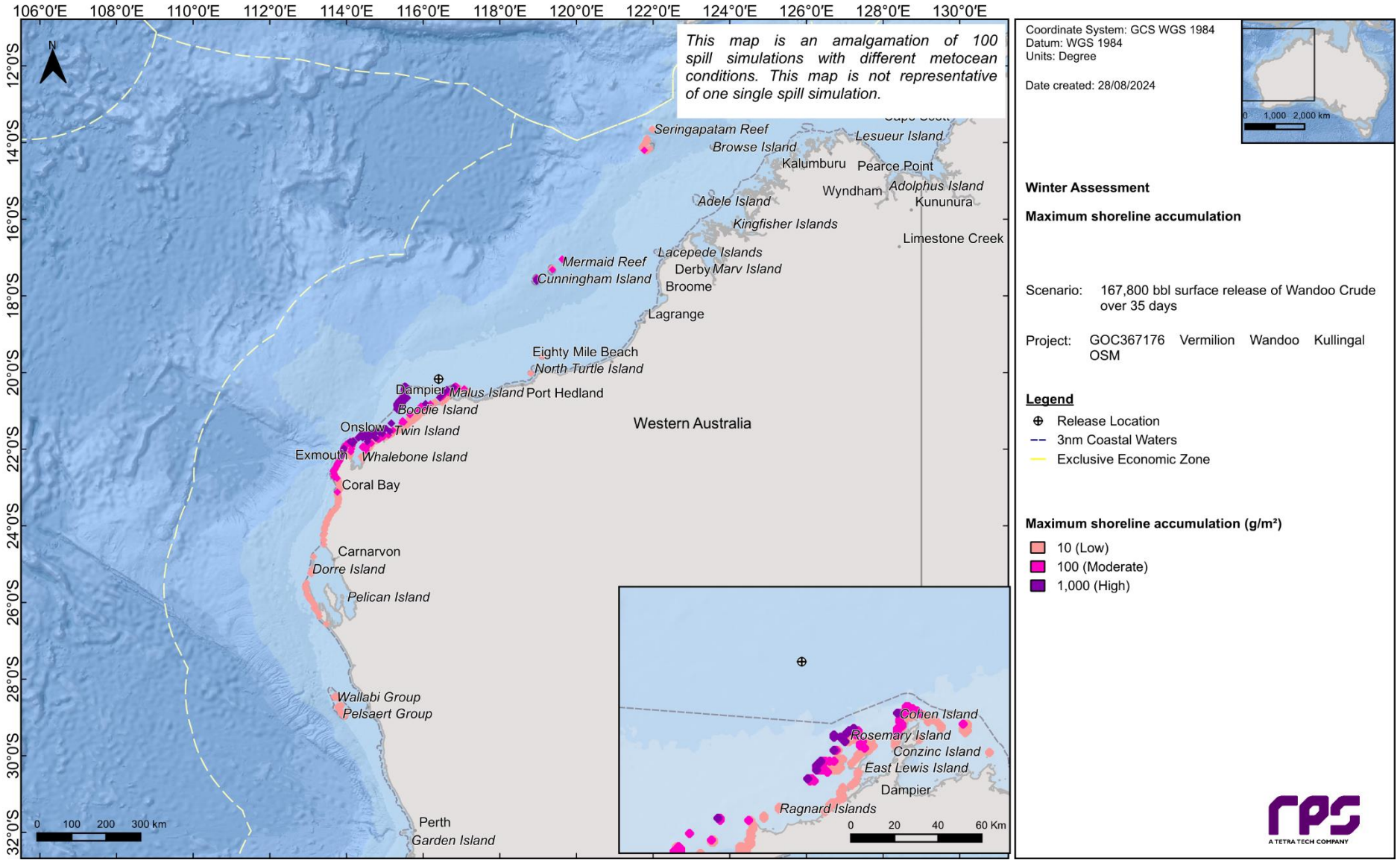

Figure 13.25 Maximum potential shoreline oil accumulation following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

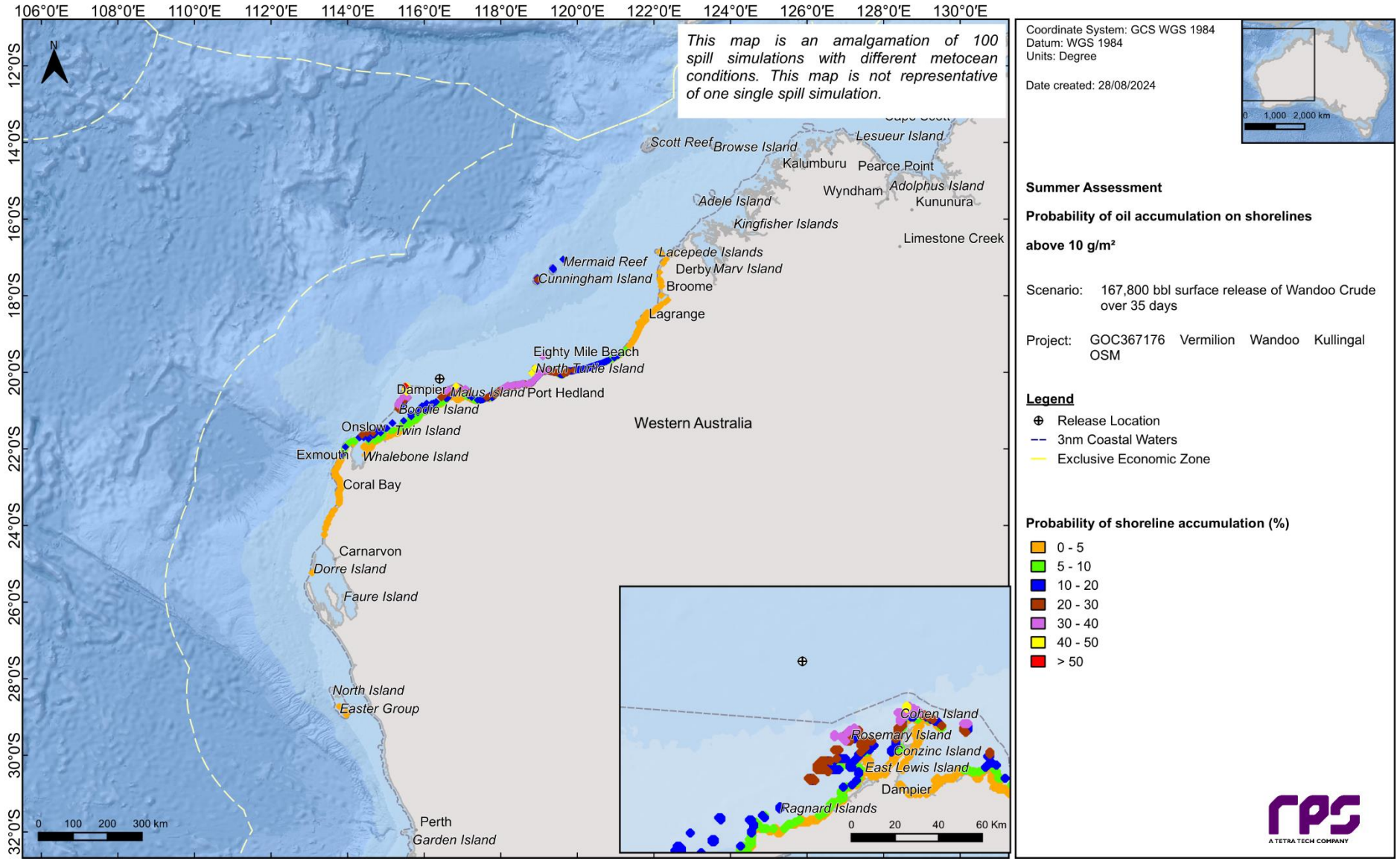

Figure 13.26 Predicted probability of shoreline oil accumulation at, or above, 10 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

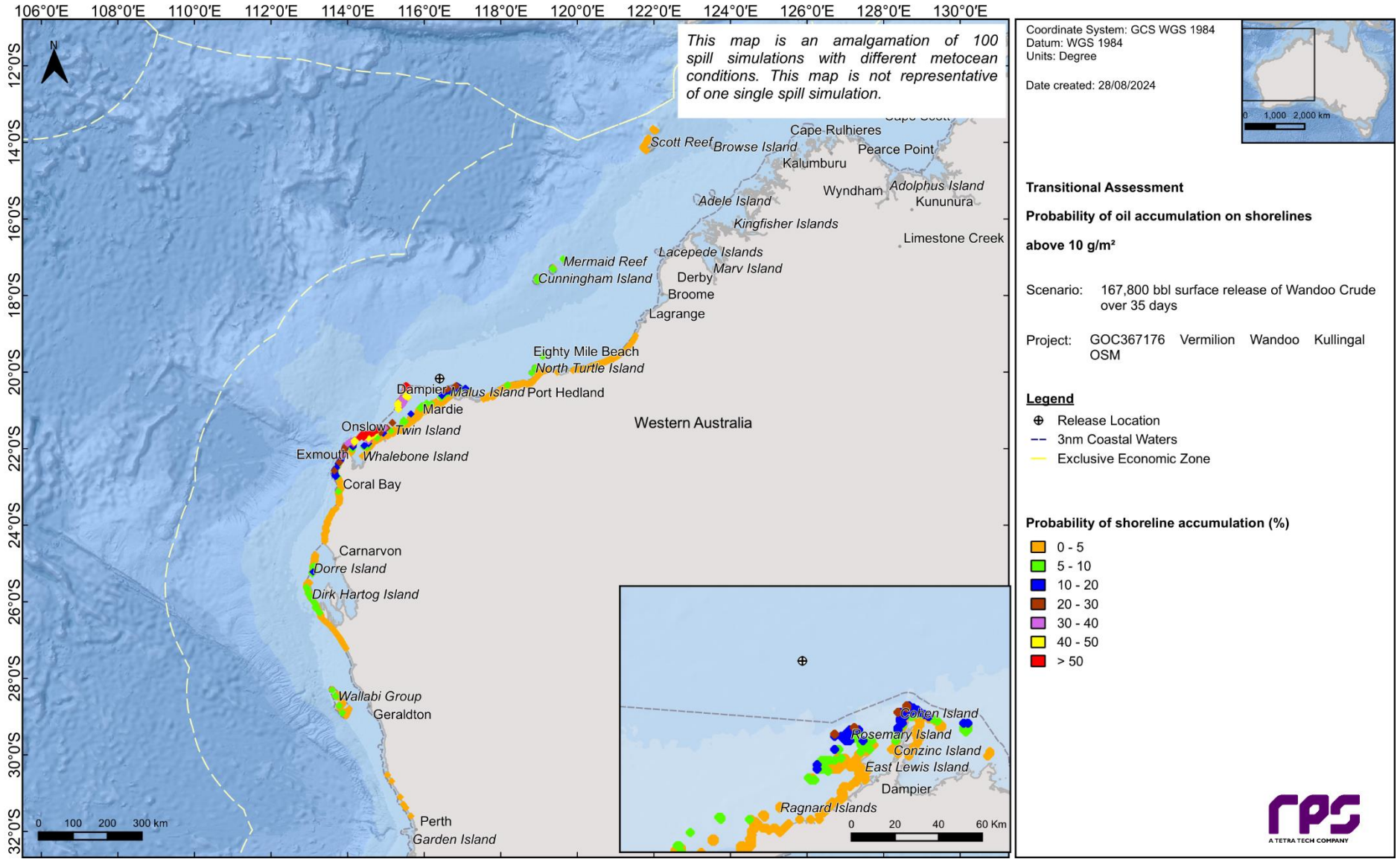

Figure 13.27 Predicted probability of shoreline oil accumulation at, or above, 10 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

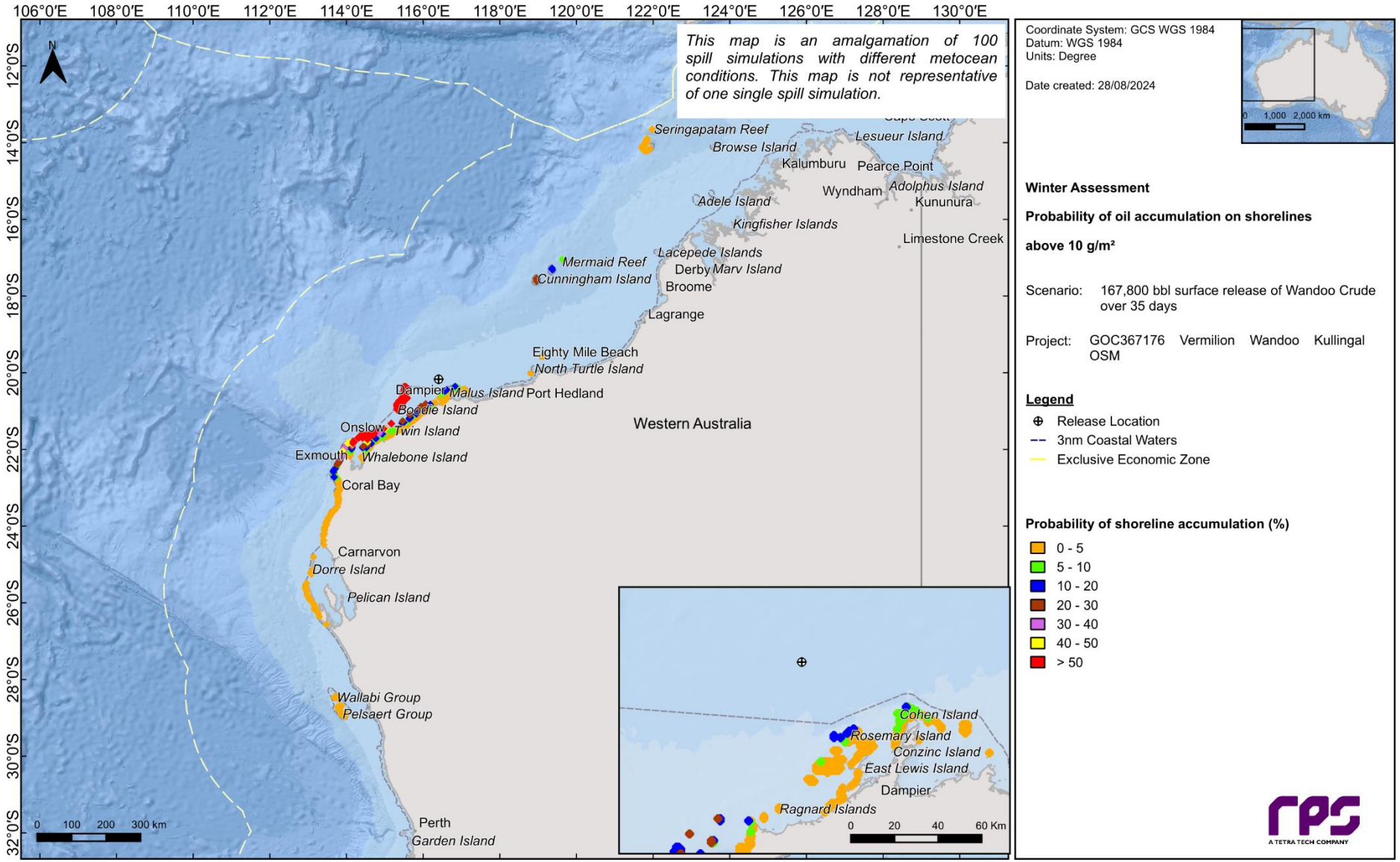

Figure 13.28 Predicted probability of shoreline oil accumulation at, or above, 10 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

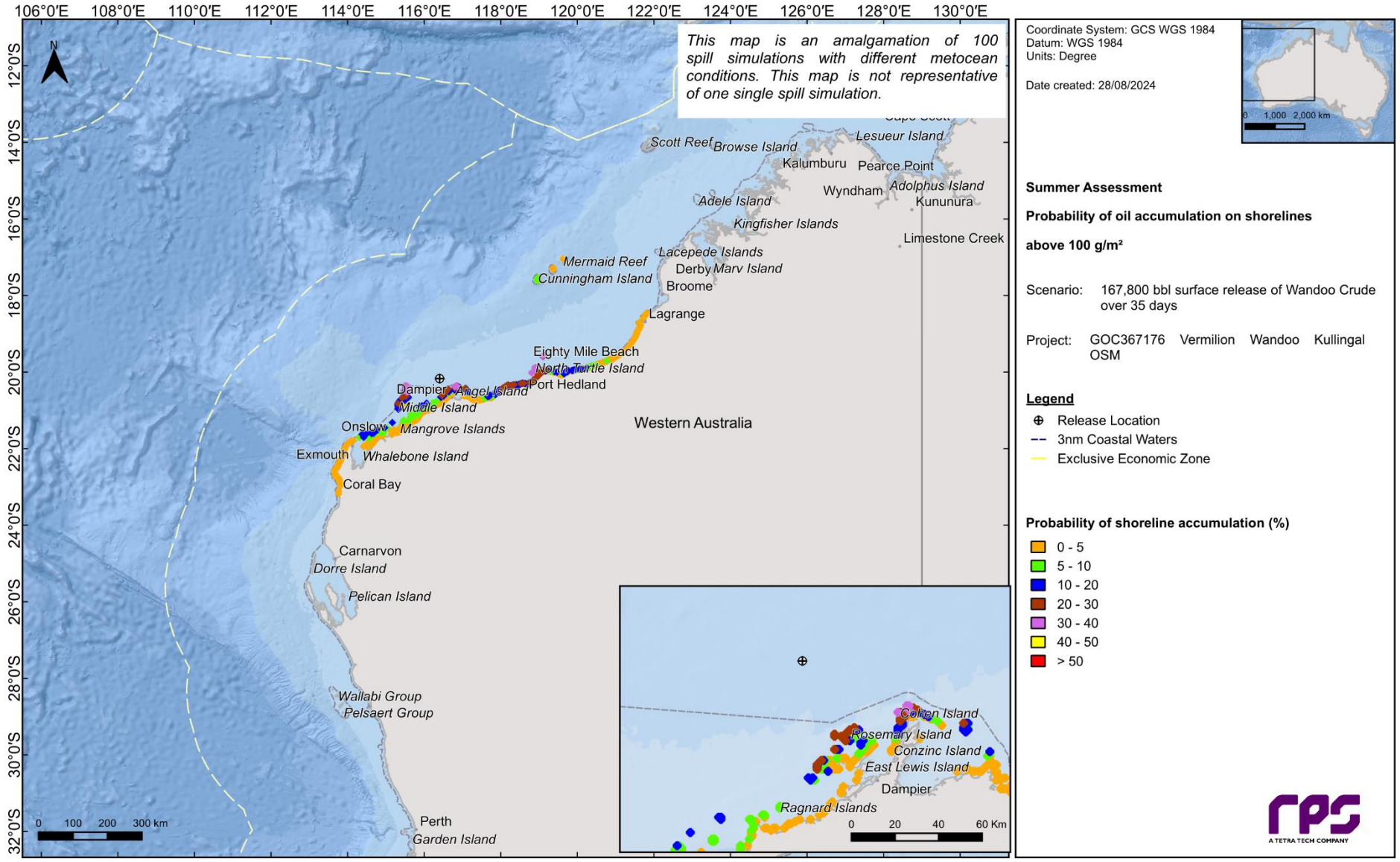

Figure 13.29 Predicted probability of shoreline oil accumulation at, or above, 100 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

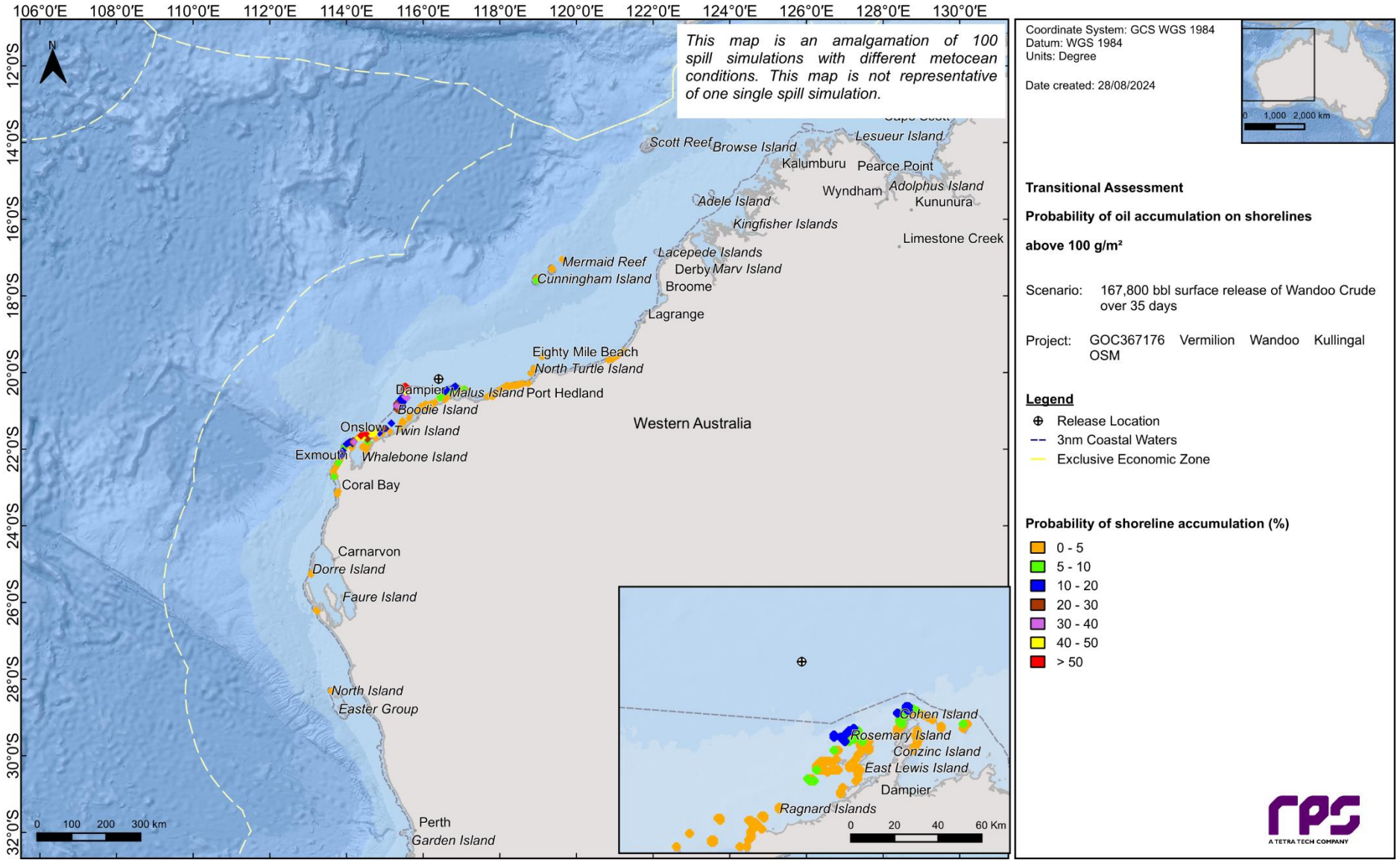

Figure 13.30 Predicted probability of shoreline oil accumulation at, or above, 100 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

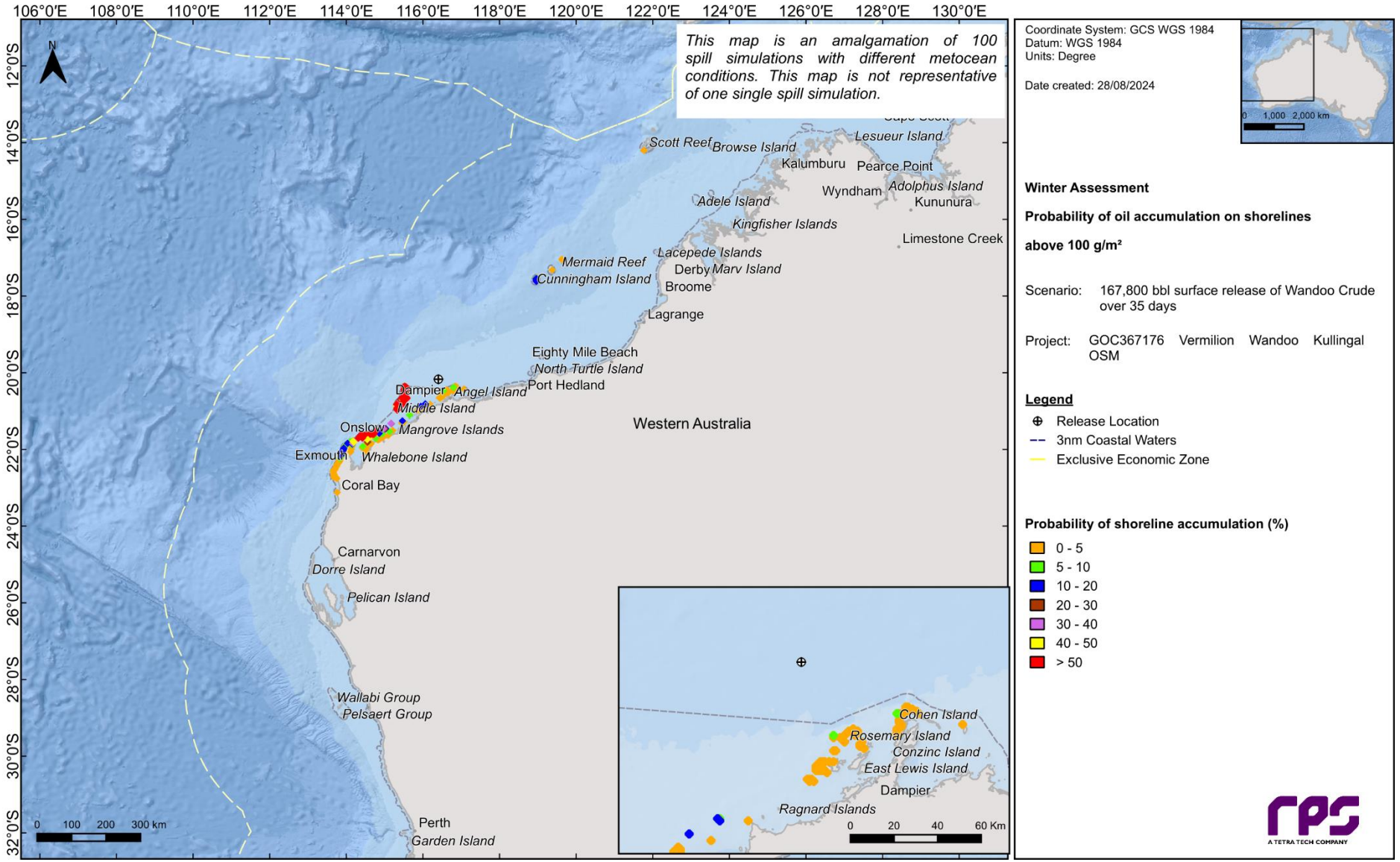

Figure 13.31 Predicted probability of shoreline oil accumulation at, or above, 100 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

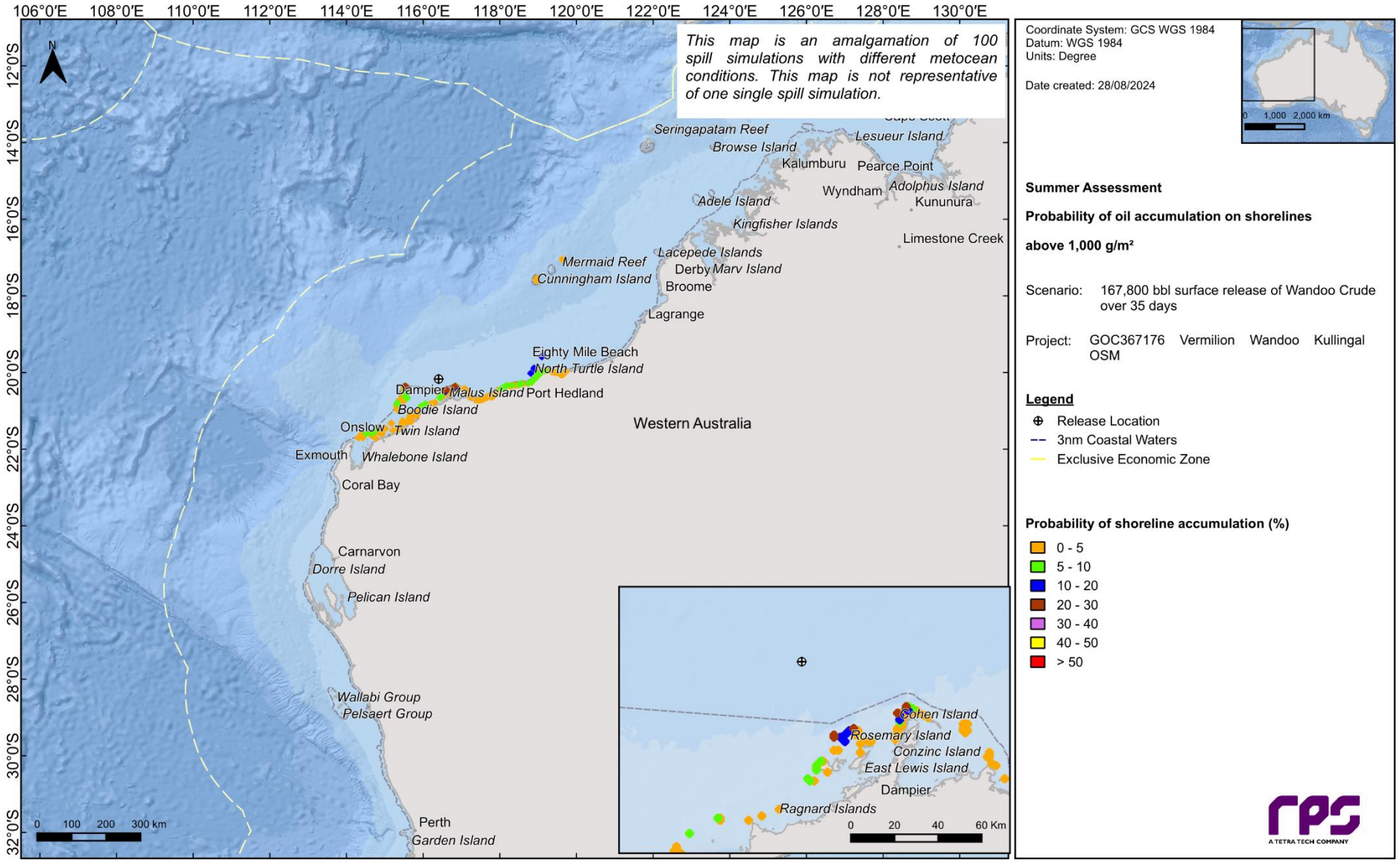

Figure 13.32 Predicted probability of shoreline oil accumulation at, or above, 1,000 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

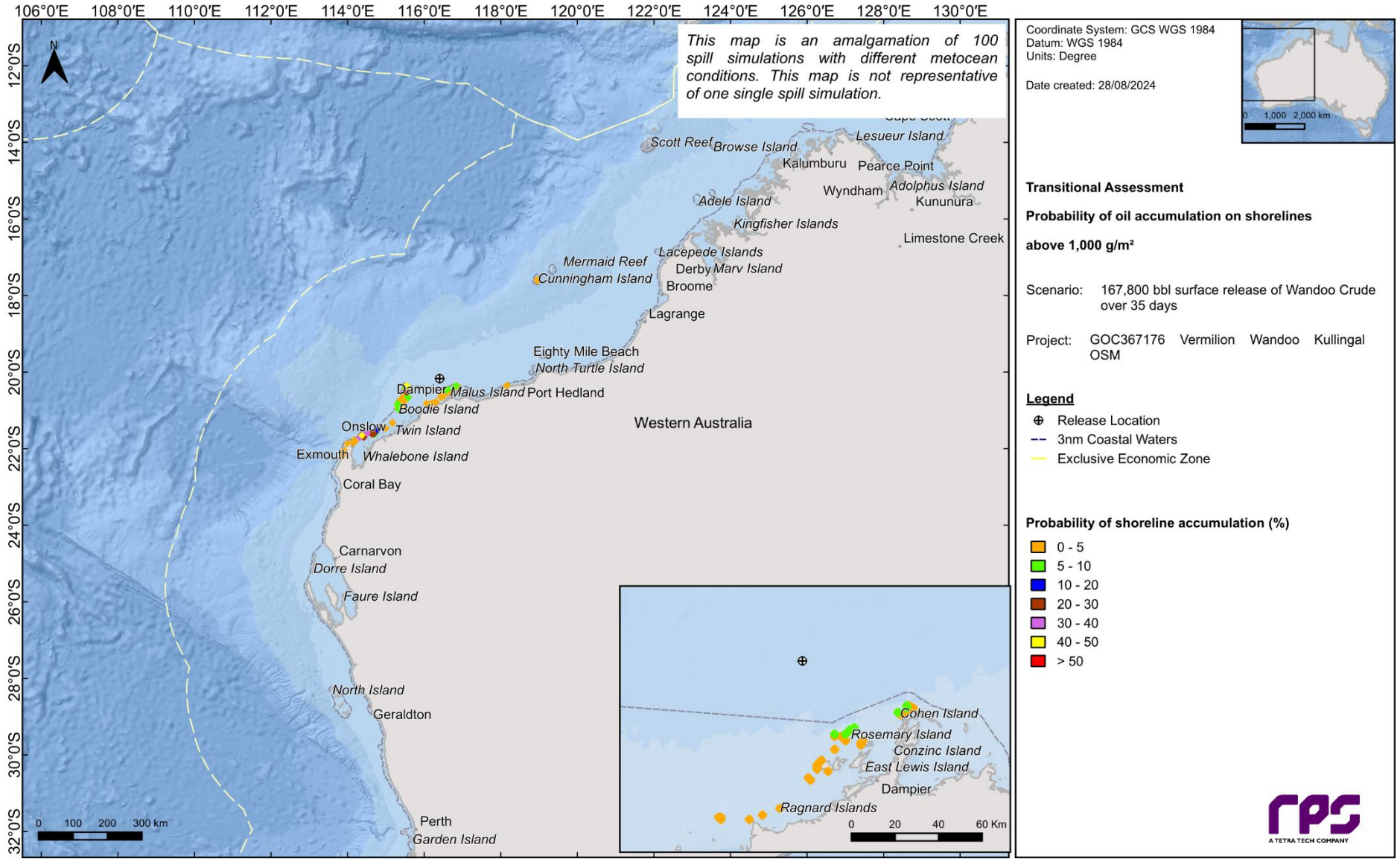

Figure 13.33 Predicted probability of shoreline oil accumulation at, or above, 1,000 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

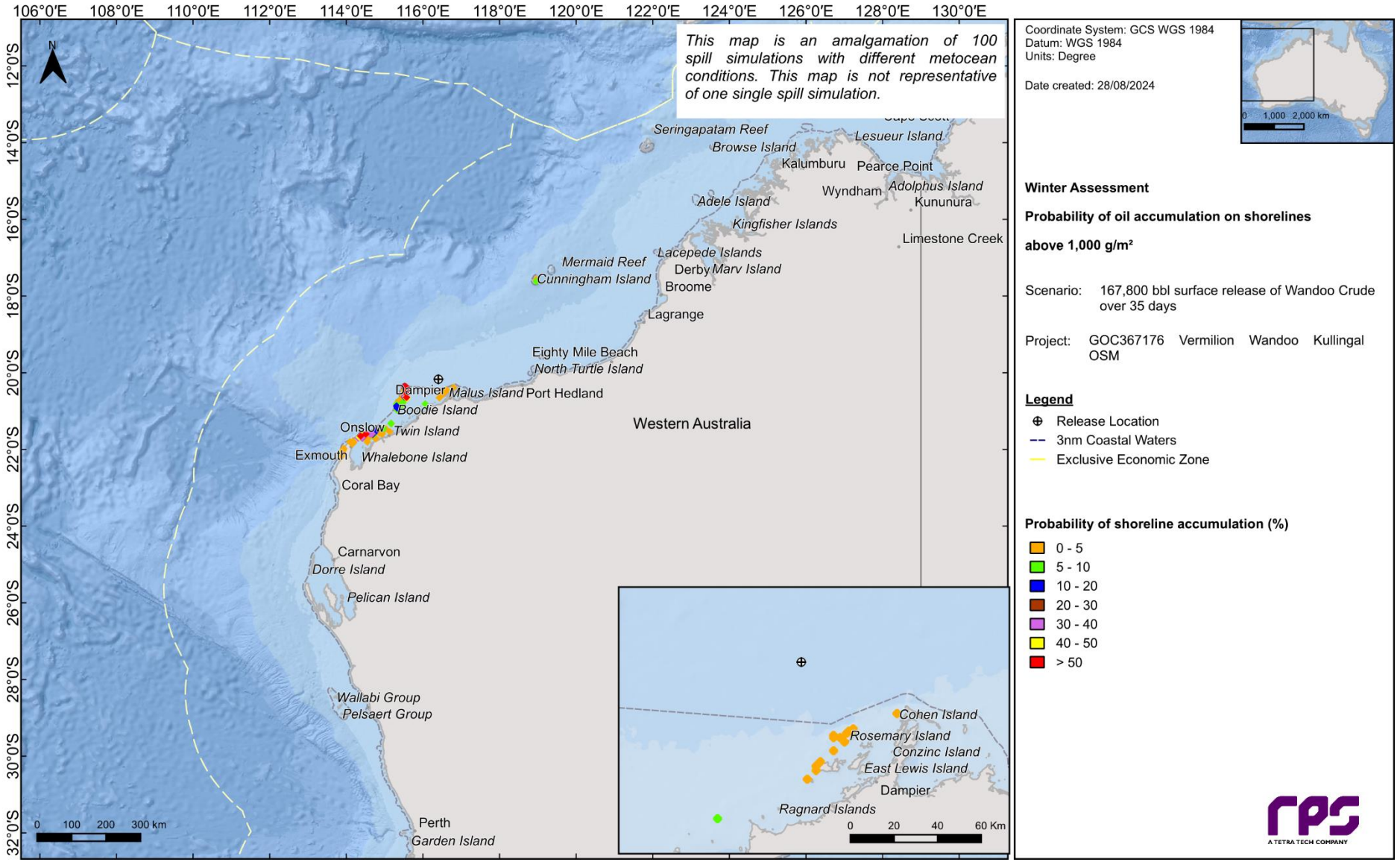

Figure 13.34 Predicted probability of shoreline oil accumulation at, or above, 1,000 g/m² following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

13.1.4 In-water exposure

13.1.4.1 Dissolved Hydrocarbons

Table 13.7 summarises the maximum distances from the release location to the dissolved hydrocarbon exposure thresholds for each season. Concentrations exceeding 10 ppb may potentially extend up to 790 km from the release location. As the threshold increases to 50 ppb, the maximum distance decreases to 425 km. No exposure was predicted above 400 ppb.

Table 13.8 summarises the predicted dissolved hydrocarbon exposure to receptors (either at, or above, receptors in the water column).

The Montebello AMP recorded the highest probabilities of exposure at, or above, 10 ppb during summer (50%), transitional (82%) and winter (89%) conditions. Additionally, the quickest time to exposure was recorded for Montebello AMP at, or above, 10 ppb during summer (26 hours), transitional (29 hours) and winter (27 hours) conditions. The Montebello AMP also recorded the highest concentration at 153 ppb during summer conditions.

Figure 13.35 to Figure 13.37 illustrate the dissolved hydrocarbon exposure zones for the three seasons, whilst Figure 13.38 to Figure 13.49 show the minimum times before exposure and probabilities of exposure at or above, 10 ppb and 50 ppb.

Seasonal cross-sectional transects (north-south and east-west) of the maximum dissolved hydrocarbons in the vicinity of the release site are presented in Figure 13.50 to Figure 13.55.

Table 13.7 Maximum distances from the release location to dissolved hydrocarbon exposure thresholds following a surface LOWC at Kullingal. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Dissolved hydrocarbon exposure thresholds		
		10 ppb	50 ppb	400 ppb
Summer	Maximum distance (km) from release location	487	253	-
	Direction	West	Southwest	-
Transitional	Maximum distance (km) from release location	790	382	-
	Direction	Southwest	Southwest	-
Winter	Maximum distance (km) from release location	575	425	-
	Direction	Southwest	Southwest	-

Table 13.8 Receptors predicted to be exposed by dissolved hydrocarbons following a surface LOWC at Kullingal. Results were calculated from100 spill simulations per season.

Category	Name	Summer								Transitional								Winter							
		Probability (%) of dissolved concentration			Minimum time to receptor waters (hours) at			Maximum dissolved hydrocarbon concentration (ppb)		Probability (%) of dissolved concentration			Minimum time to receptor waters (hours) at			Maximum dissolved hydrocarbon concentration (ppb)		Probability (%) of dissolved concentration			Minimum time to receptor waters (hours) at			Maximum dissolved hydrocarbon concentration (ppb)	
		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	averaged over all replicate spills	in the worst replicate	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	averaged over all replicate spills	in the worst replicate	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	averaged over all replicate spills	in the worst replicate
AMP	Dampier	4	NC	NC	225	NC	NC	2	43	1	NC	NC	1,076	NC	NC	<1	11	11	1	NC	266	544	NC	4	59
	Gascoyne	1	NC	NC	639	NC	NC	<1	50	11	1	NC	341	364	NC	4	77	NC	NC	NC	NC	NC	NC	NC	NC
	Montebello	50	3	NC	26	67	NC	11	153	82	7	NC	29	58	NC	22	133	89	7	NC	27	38	NC	25	120
KEF	Ancient coastline at 125 m depth contour	7	1	NC	200	307	NC	3	98	20	2	NC	217	263	NC	6	86	21	2	NC	183	408	NC	6	93
	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	2	NC	NC	541	NC	NC	<1	43	17	1	NC	277	321	NC	5	95	16	1	NC	195	419	NC	5	111
	Commonwealth waters adjacent to Ningaloo Reef	2	NC	NC	588	NC	NC	<1	43	16	2	NC	346	356	NC	5	69	20	1	NC	231	502	NC	5	58
	Continental Slope Demersal Fish Communities	4	NC	NC	309	NC	NC	2	50	11	1	NC	263	392	NC	4	72	13	1	NC	260	502	NC	4	73
	Exmouth Plateau	1	NC	NC	951	NC	NC	<1	11	2	NC	NC	574	NC	NC	<1	21	1	NC	NC	558	NC	NC	<1	20
	Glomar Shoals	19	3	NC	143	279	NC	6	86	23	1	NC	119	197	NC	6	82	11	NC	NC	77	NC	NC	4	47
MP	Barrow Island	3	1	NC	141	956	NC	2	76	17	NC	NC	140	NC	NC	5	43	26	1	NC	121	414	NC	8	103

	Montebello Islands	21	1	NC	97	111	NC	6	69	48	2	NC	80	118	NC	11	90	69	12	NC	71	73	NC	20	116
	Ningaloo	2	NC	NC	588	NC	NC	<1	43	16	2	NC	346	356	NC	5	69	20	1	NC	231	502	NC	5	58
NR	Lowendal Islands	1	NC	NC	874	NC	NC	<1	11	1	NC	NC	1,084	NC	NC	2	12	7	NC	NC	271	NC	NC	3	22
	Thevenard Island	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	878	NC	NC	<1	11	NC	NC	NC	NC	NC	NC	NC	NC
RSB	Barrow Island Reefs and Shoals	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	793	NC	NC	<1	12
	Combe Reef	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	1,042	NC	NC	<1	13	2	NC	NC	482	NC	NC	<1	27
	Dailey Shoal	NC	NC	NC	NC	NC	NC	NC	NC	4	NC	NC	442	NC	NC	2	34	5	NC	NC	321	NC	NC	2	16
	Exmouth Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	502	NC	NC	<1	26
	Fairway Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2	NC	NC	372	NC	NC	<1	27
	Glomar Shoal	7	NC	NC	243	NC	NC	3	25	5	NC	NC	183	NC	NC	2	46	6	NC	NC	175	NC	NC	2	32
	Hammersley Shoal	2	NC	NC	776	NC	NC	<1	14	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Hood Reef	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	982	NC	NC	2	14	4	NC	NC	365	NC	NC	2	45
	Madeleine Shoals	3	NC	NC	203	NC	NC	2	20	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Montebello Shoals	8	NC	NC	123	NC	NC	3	47	21	NC	NC	124	NC	NC	6	37	44	1	NC	129	433	NC	11	57
	Ningaloo Reef	NC	NC	NC	NC	NC	NC	NC	NC	3	NC	NC	397	NC	NC	2	23	6	NC	NC	532	NC	NC	2	34
	North West Reef	NC	NC	NC	NC	NC	NC	NC	NC	5	NC	NC	694	NC	NC	3	23	3	NC	NC	644	NC	NC	2	24
	Otway Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2	NC	NC	468	NC	NC	<1	19
	Outtrim Patches	1	NC	NC	746	NC	NC	<1	14	11	1	NC	434	486	NC	5	64	14	NC	NC	212	NC	NC	5	38
	Penguin Bank	NC	NC	NC	NC	NC	NC	NC	NC	11	NC	NC	472	NC	NC	4	29	17	NC	NC	186	NC	NC	6	48
	Poivre Reef	2	NC	NC	932	NC	NC	<1	22	4	NC	NC	598	NC	NC	2	18	4	NC	NC	217	NC	NC	3	21
	Rankin Bank	2	NC	NC	357	NC	NC	<1	27	3	NC	NC	363	NC	NC	2	20	2	NC	NC	694	NC	NC	2	15
	Ripple Shoals	1	NC	NC	933	NC	NC	<1	19	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	439	NC	NC	<1	11
	Rosily Shoals	NC	NC	NC	NC	NC	NC	NC	NC	4	1	NC	494	918	NC	3	61	8	1	NC	283	470	NC	4	55
	Spider Reef	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	765	NC	NC	<1	11	1	NC	NC	378	NC	NC	<1	19
	Trap Reef	NC	NC	NC	NC	NC	NC	NC	NC	2	NC	NC	594	NC	NC	2	13	1	NC	NC	510	NC	NC	<1	16
	Tryal Rocks	22	1	NC	181	488	NC	7	54	52	7	NC	95	201	NC	17	96	54	3	NC	65	169	NC	16	74
	Web Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2	NC	NC	387	NC	NC	<1	15

State and Territory Waters	WA	41	2	NC	27	86	NC	9	93	NC	NC	NC	NC	NC	NC	NC	NC	85	12	NC	44	54	NC	20	135

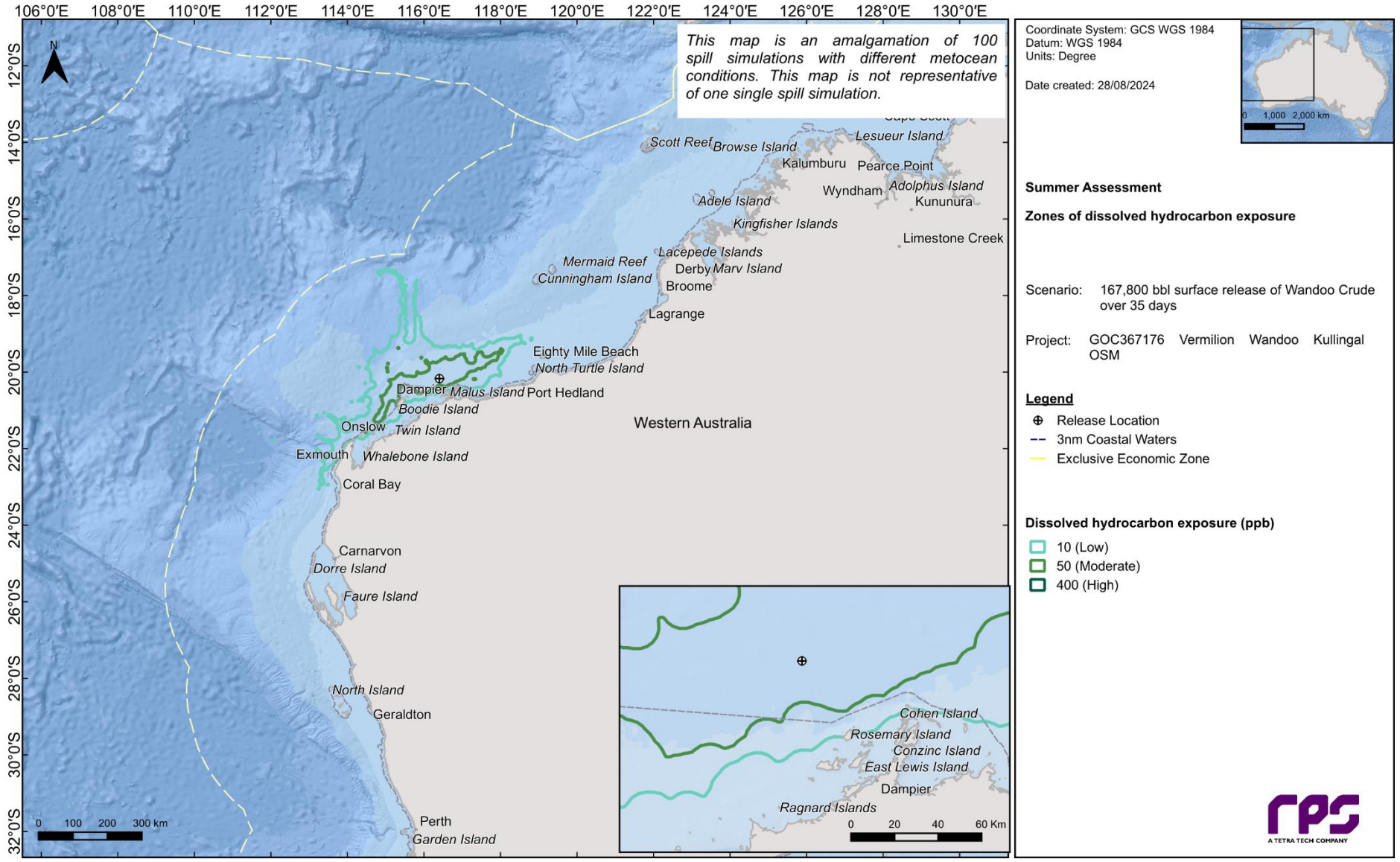

Figure 13.35 Predicted zones of dissolved hydrocarbon exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

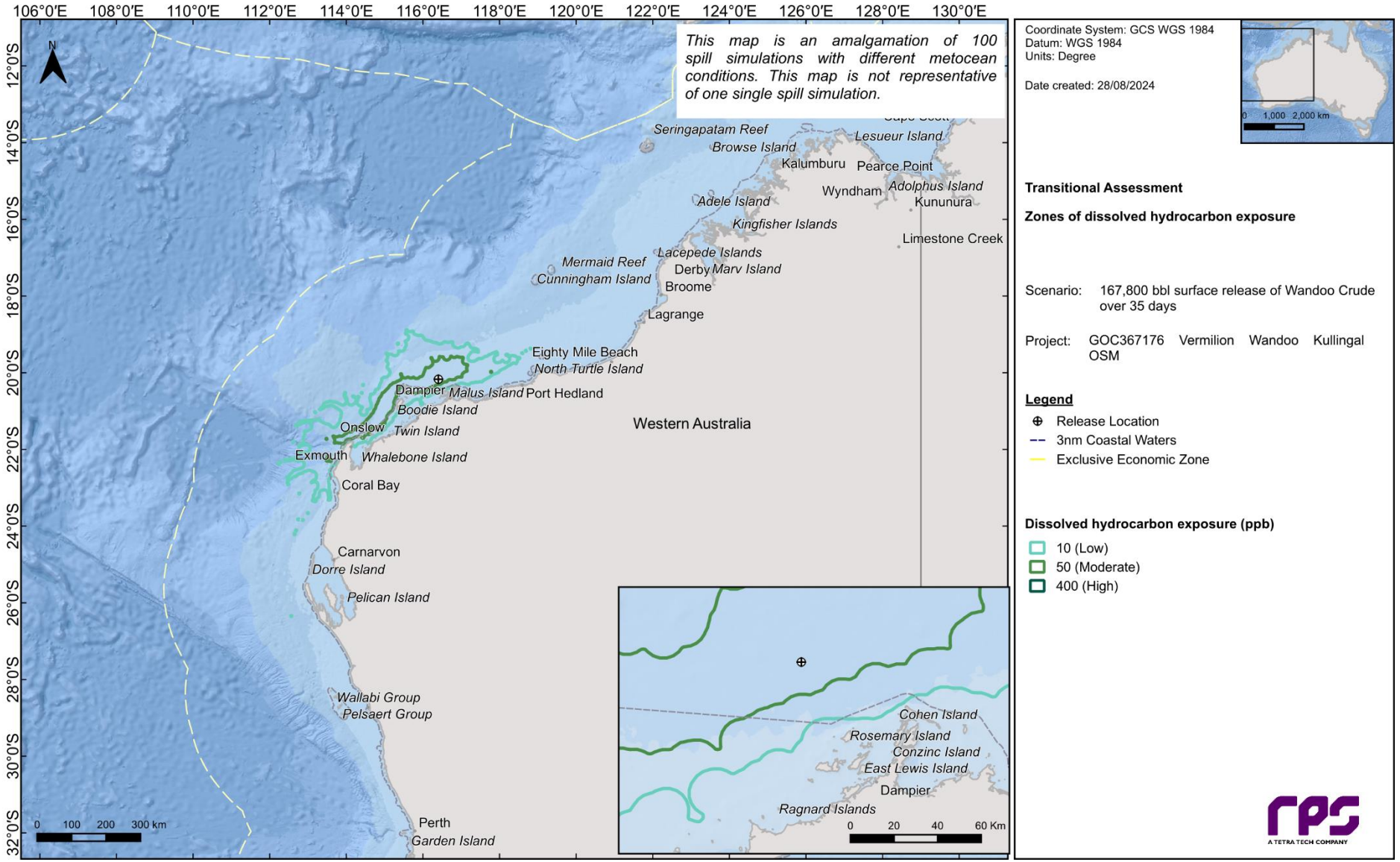

Figure 13.36 Predicted zones of dissolved hydrocarbon exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

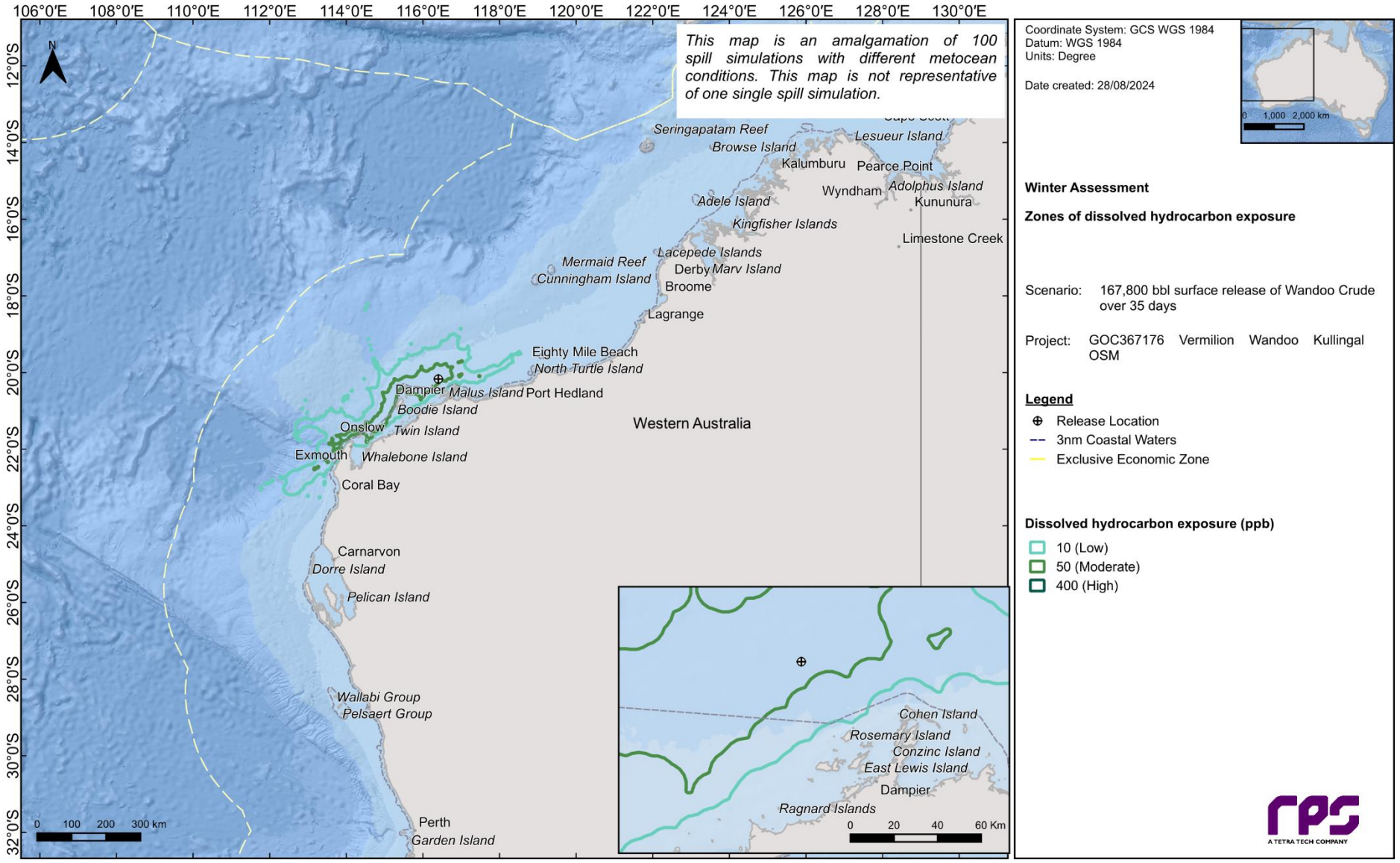

Figure 13.37 Predicted zones of dissolved hydrocarbon exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

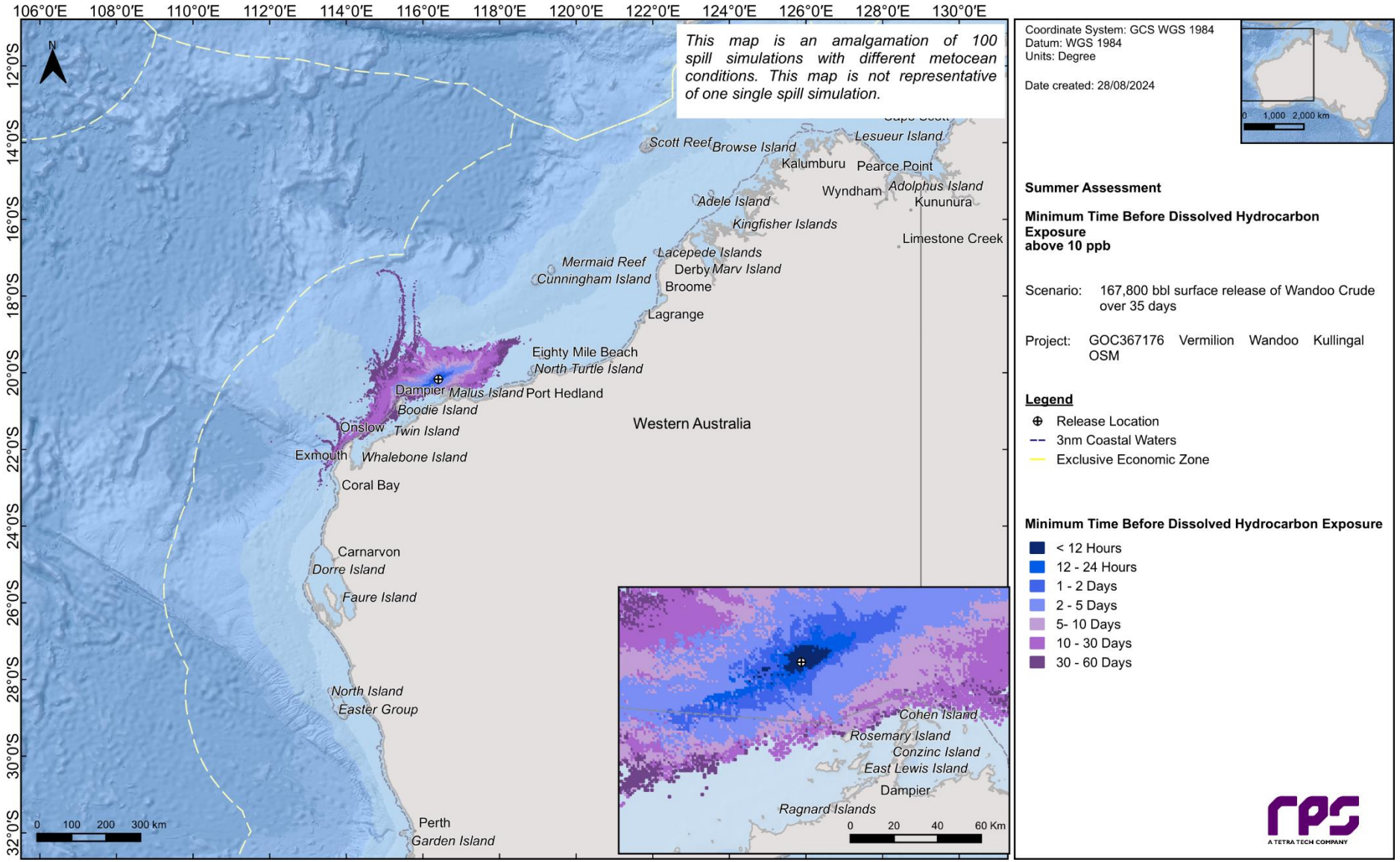

Figure 13.38 Minimum time before dissolved hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

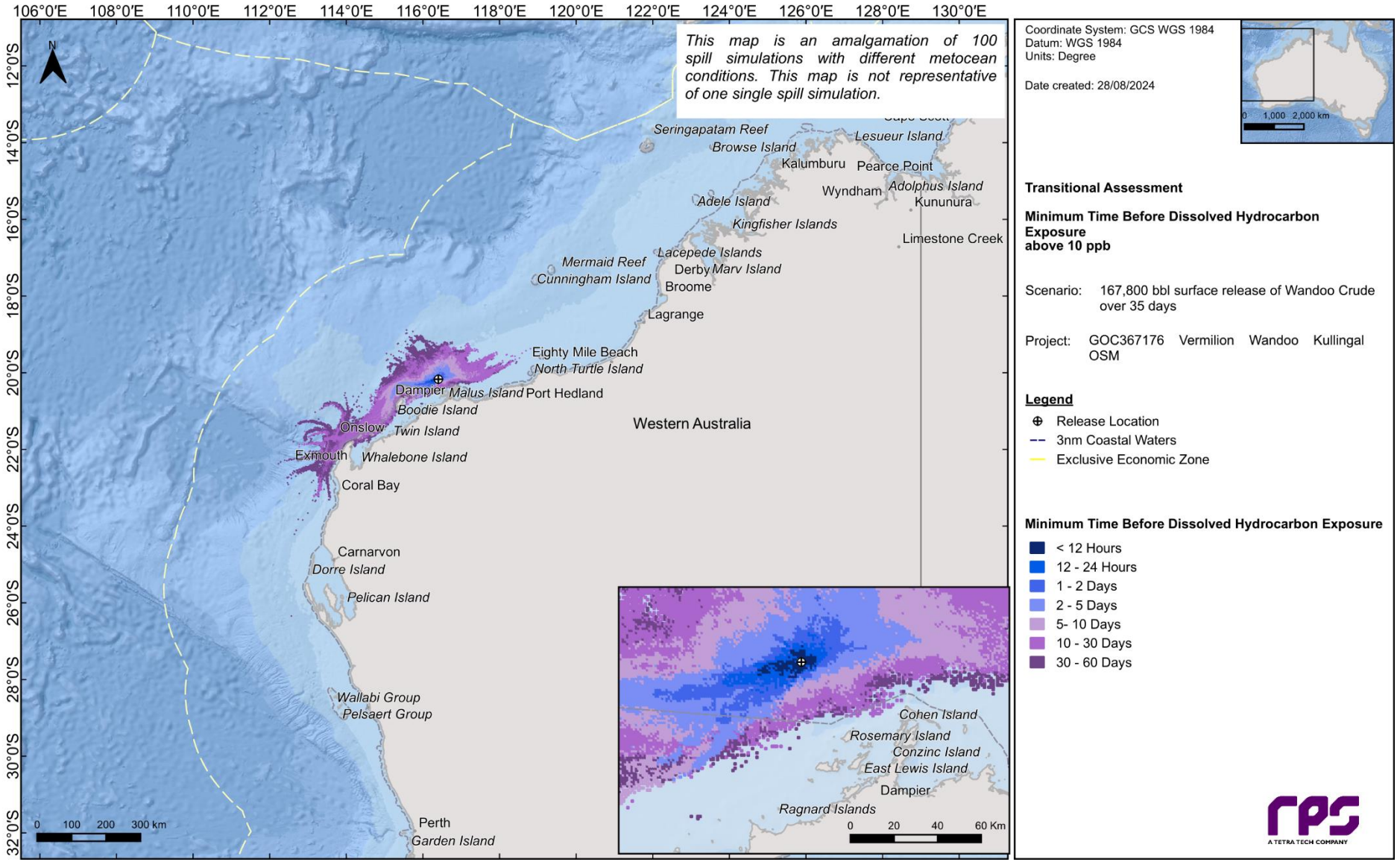

Figure 13.39 Minimum time before dissolved hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

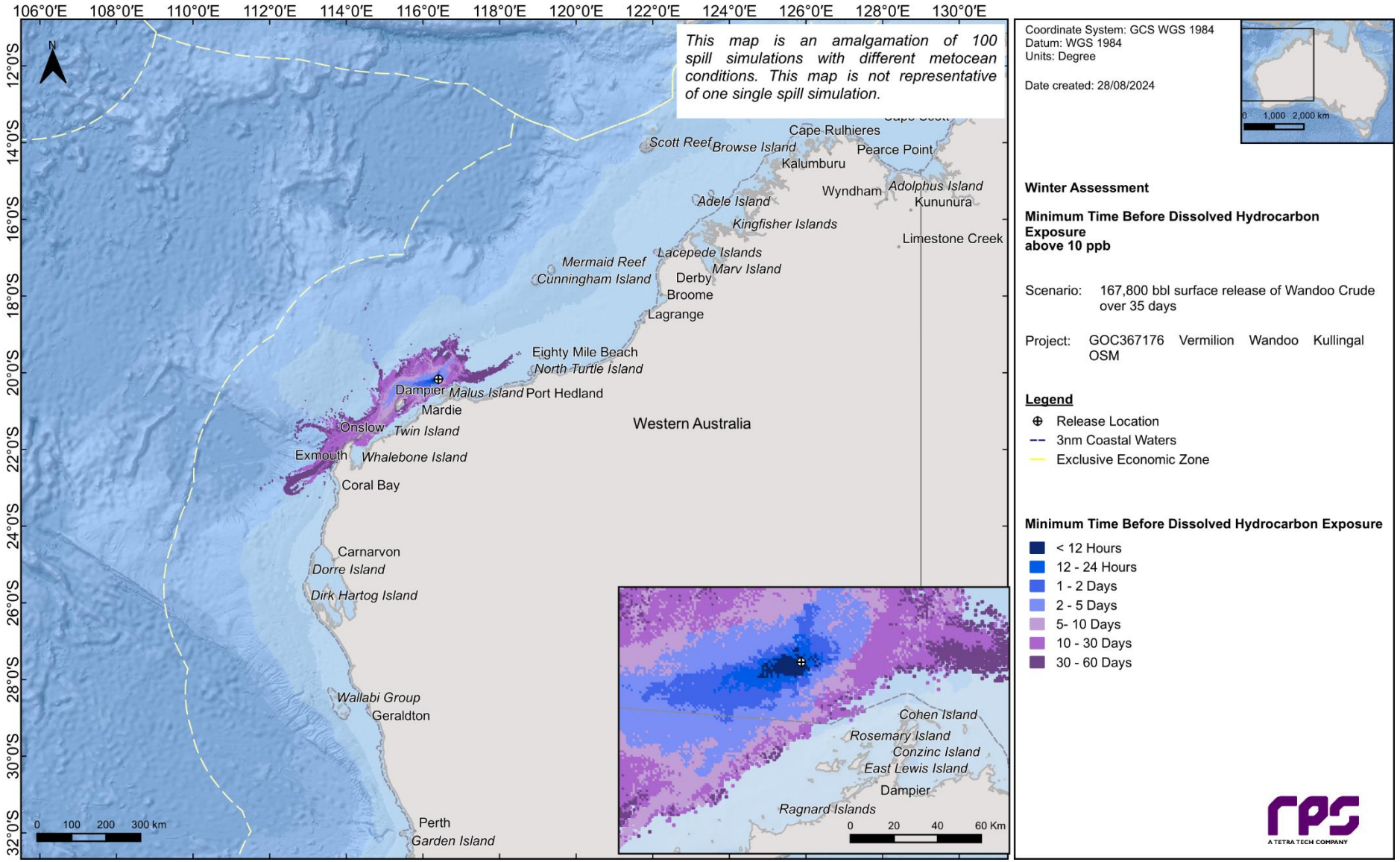

Figure 13.40 Minimum time before dissolved hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

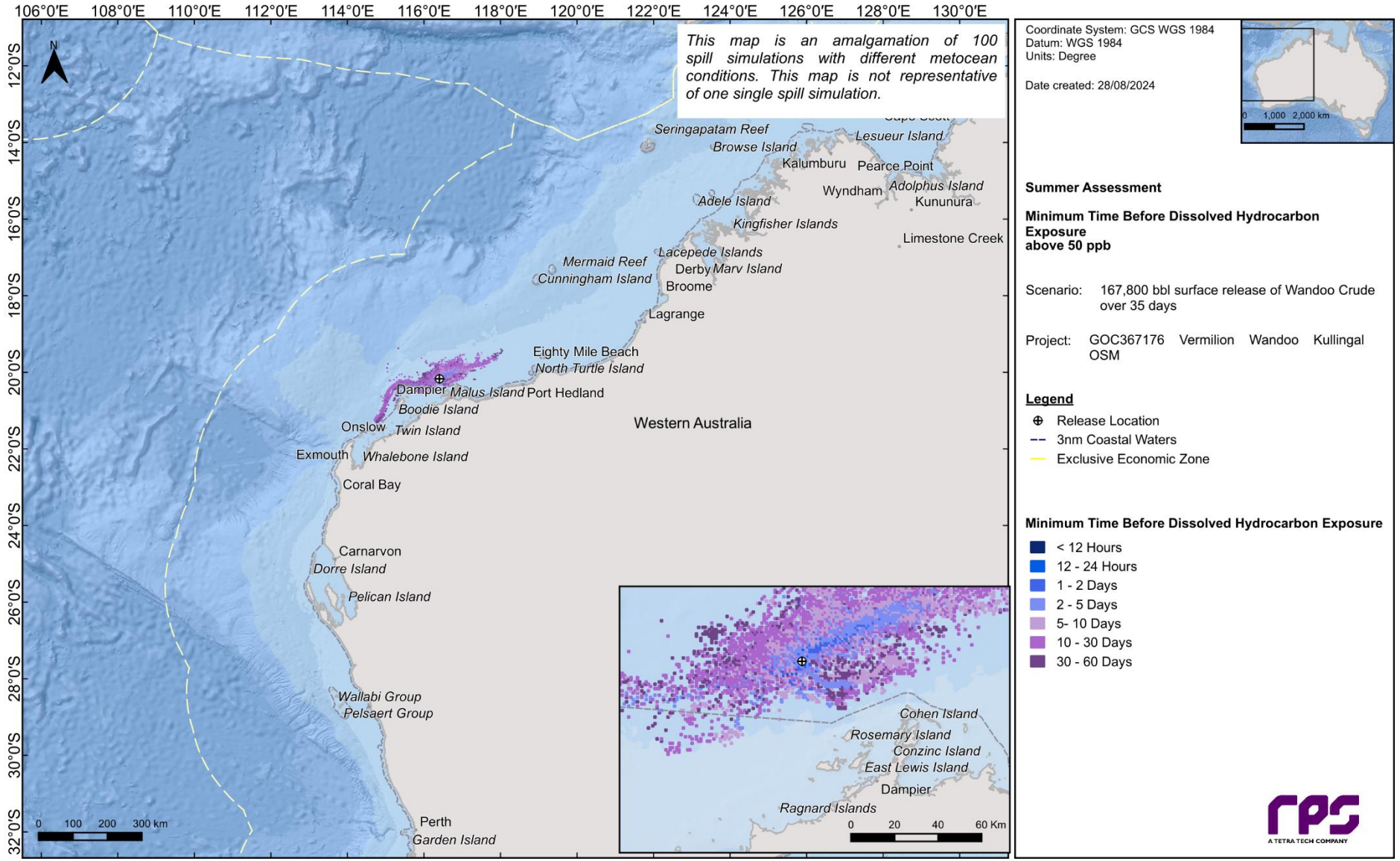

Figure 13.41 Minimum time before dissolved hydrocarbon exposure at, or above, 50 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

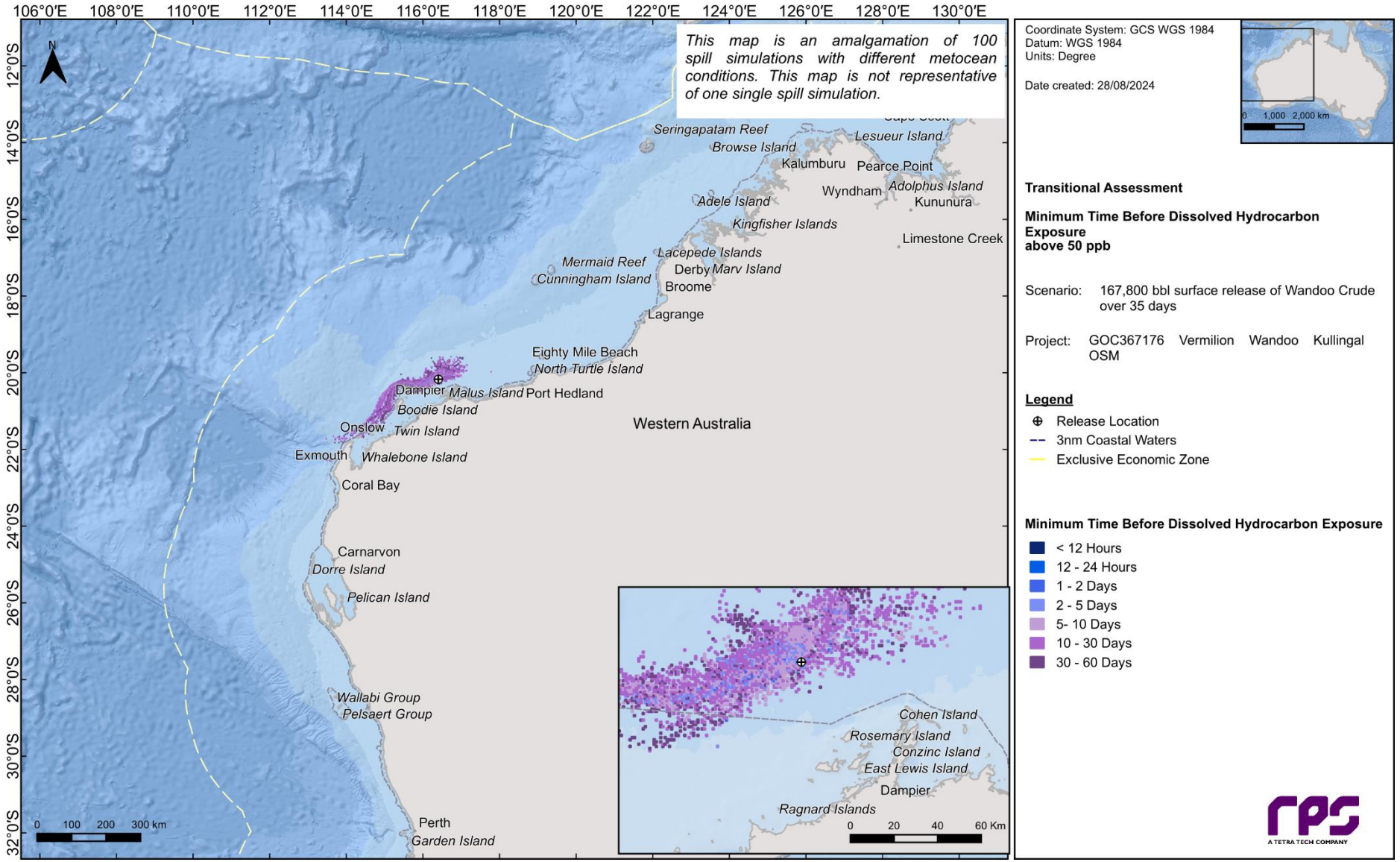

Figure 13.42 Minimum time before dissolved hydrocarbon exposure at, or above, 50 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

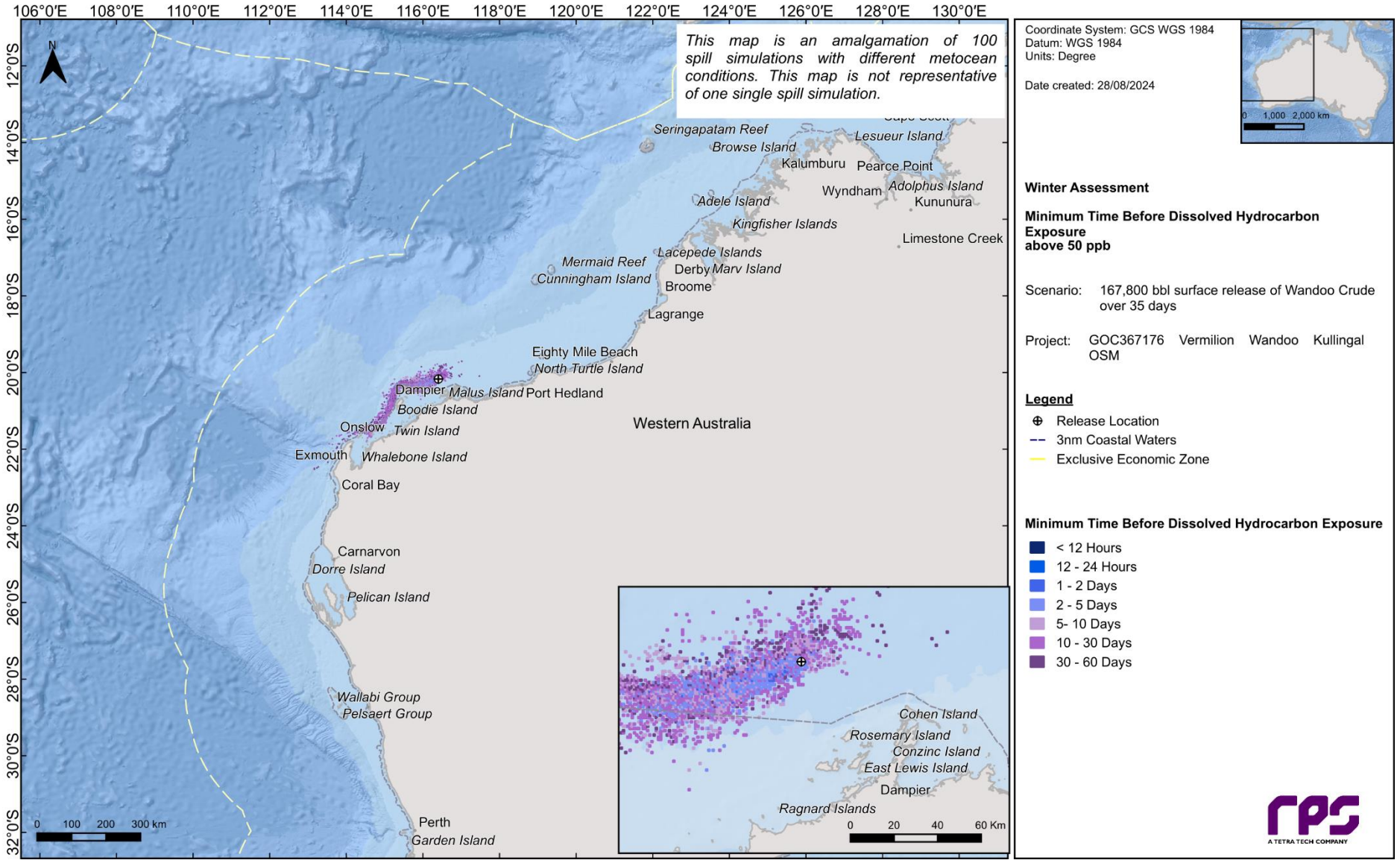

Figure 13.43 Minimum time before dissolved hydrocarbon exposure at, or above, 50 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

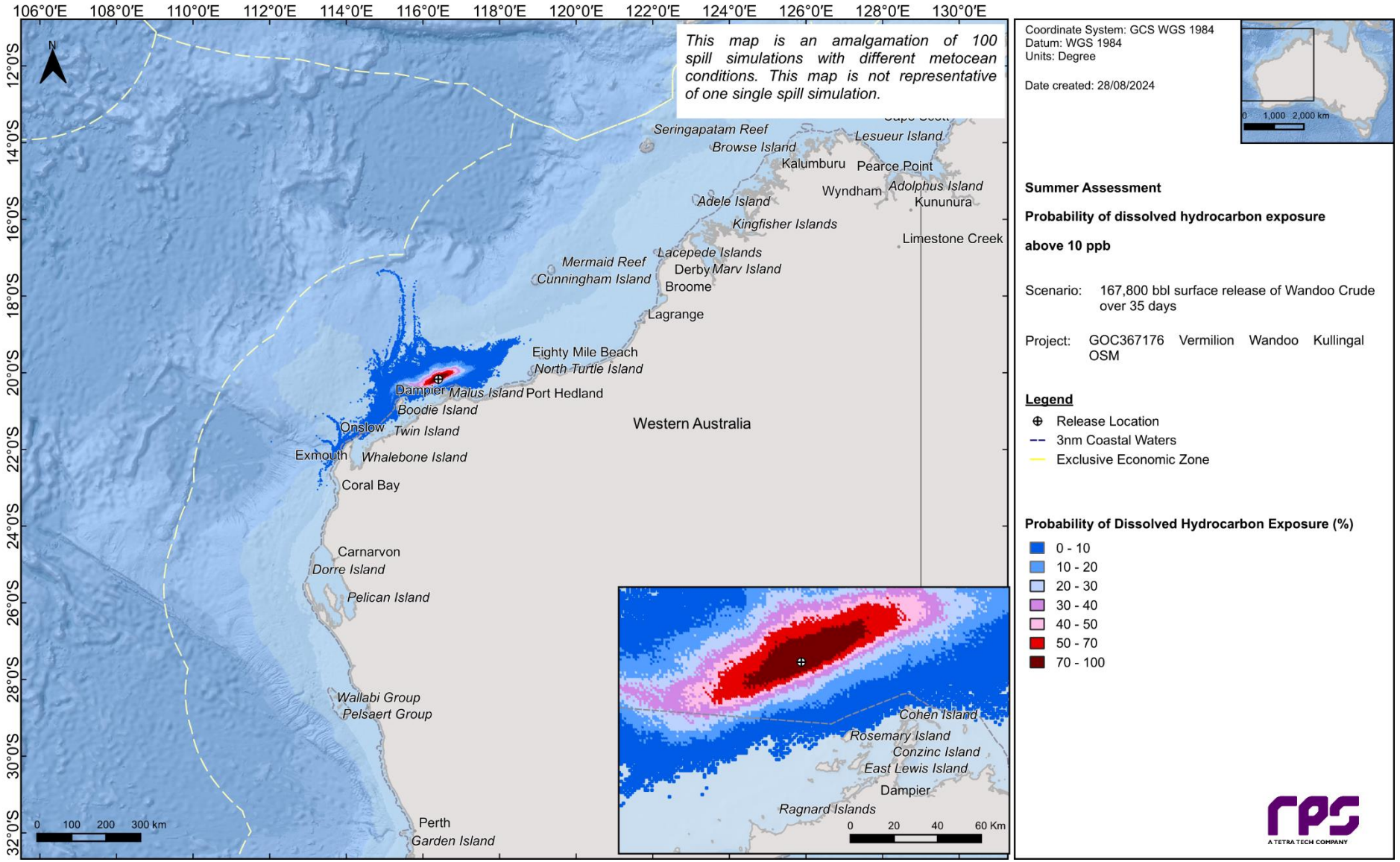

Figure 13.44 Probability of dissolved hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

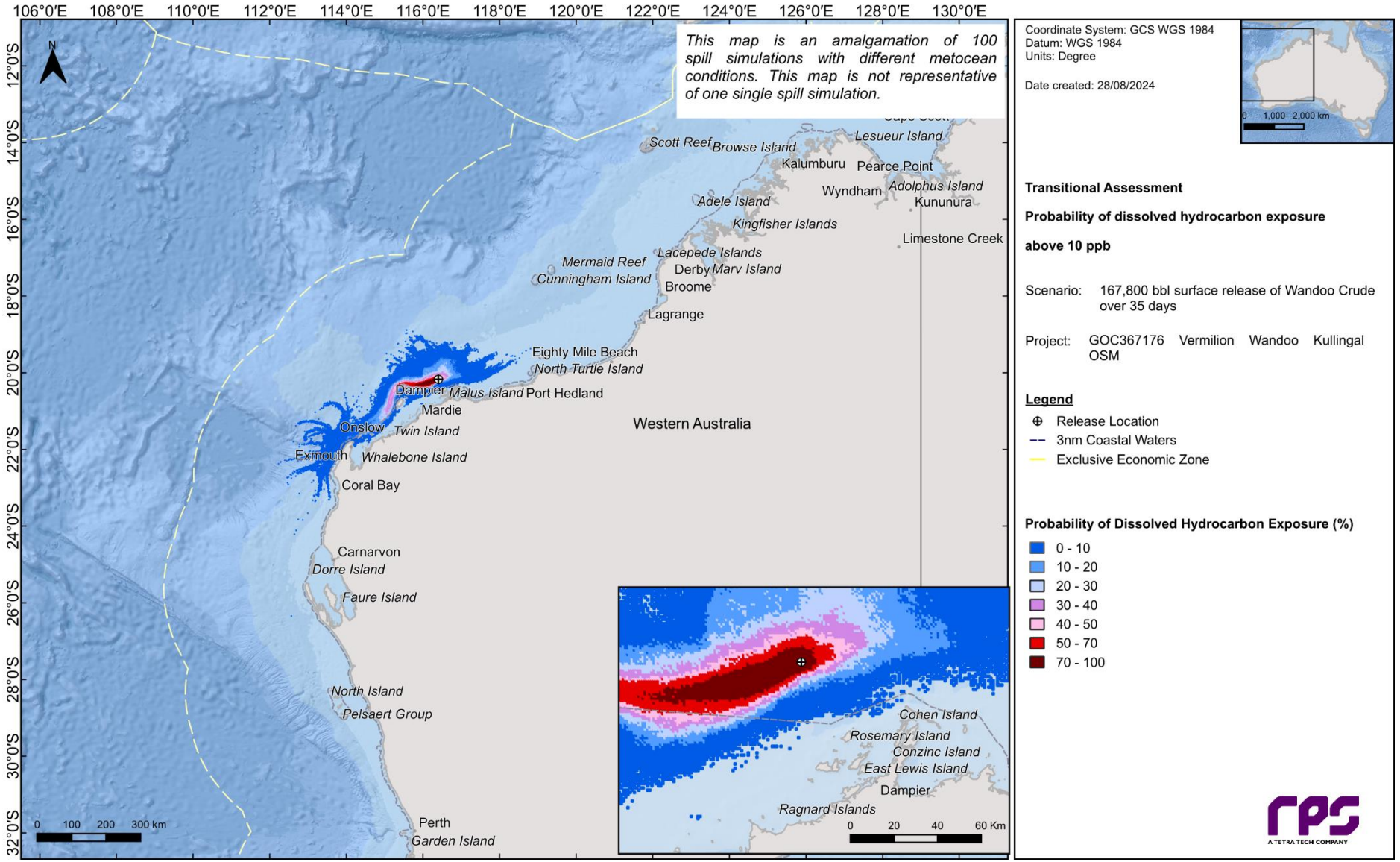

Figure 13.45 Probability of dissolved hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

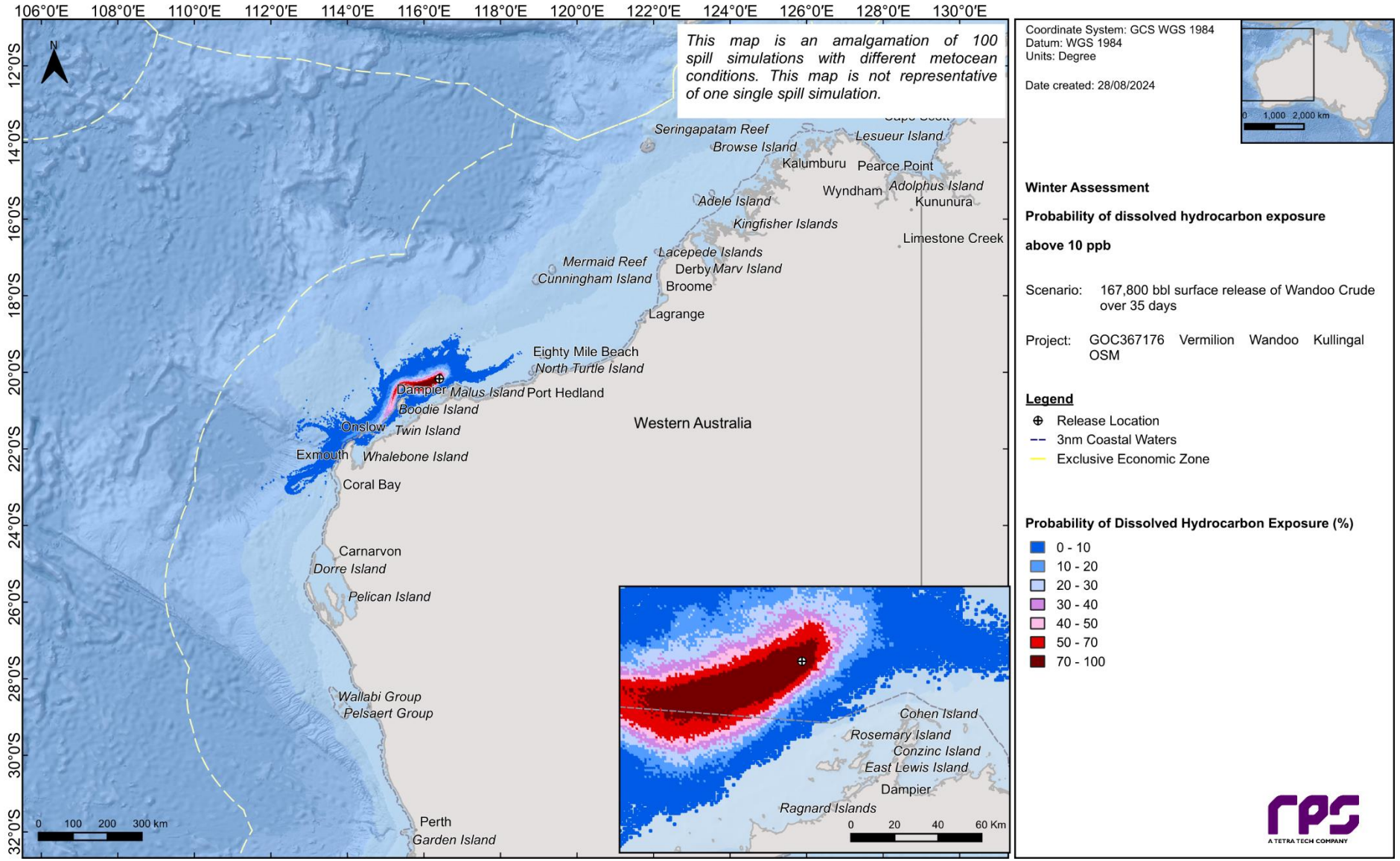

Figure 13.46 Probability of dissolved hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

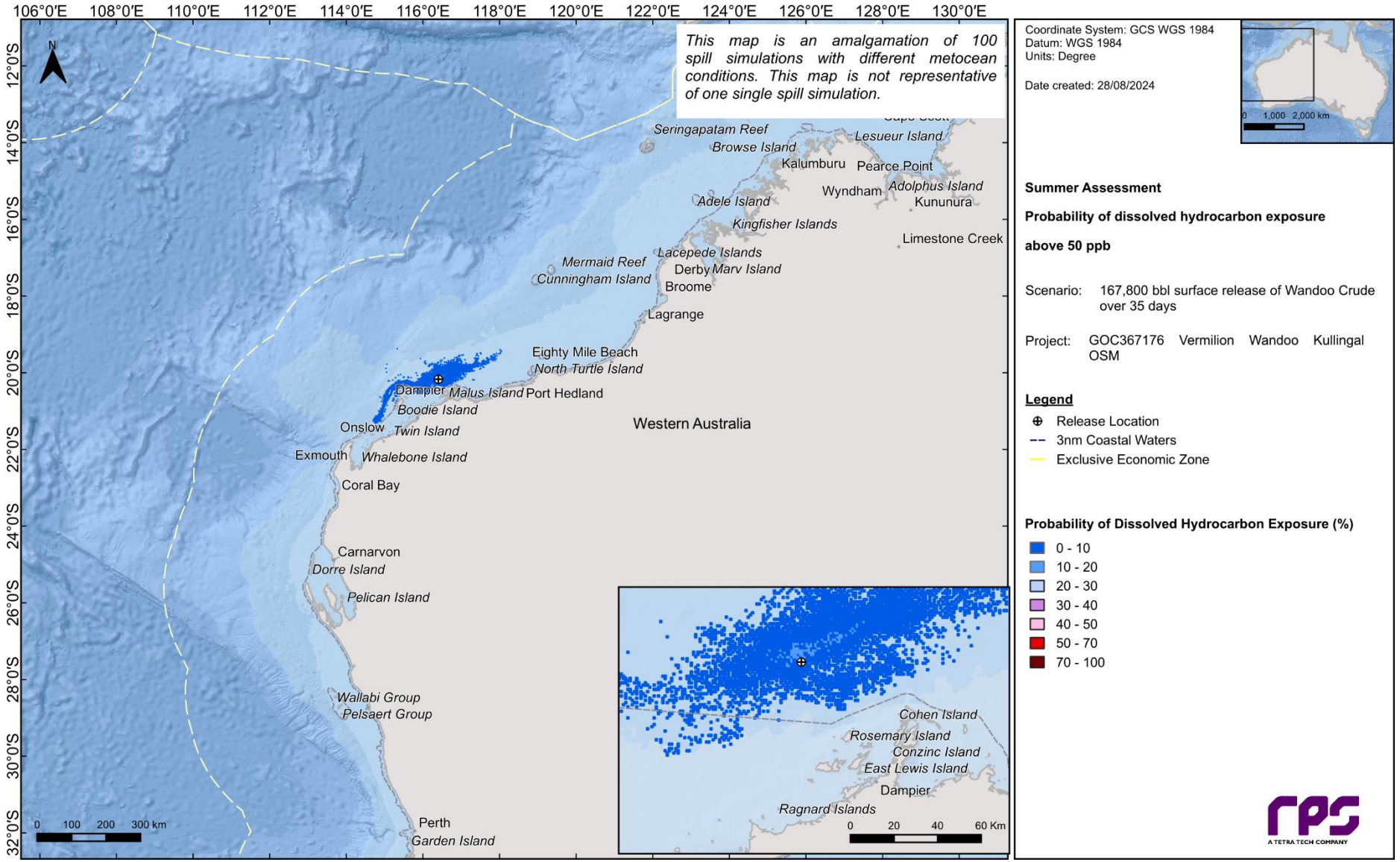

Figure 13.47 Probability of dissolved hydrocarbon exposure at, or above, 50 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

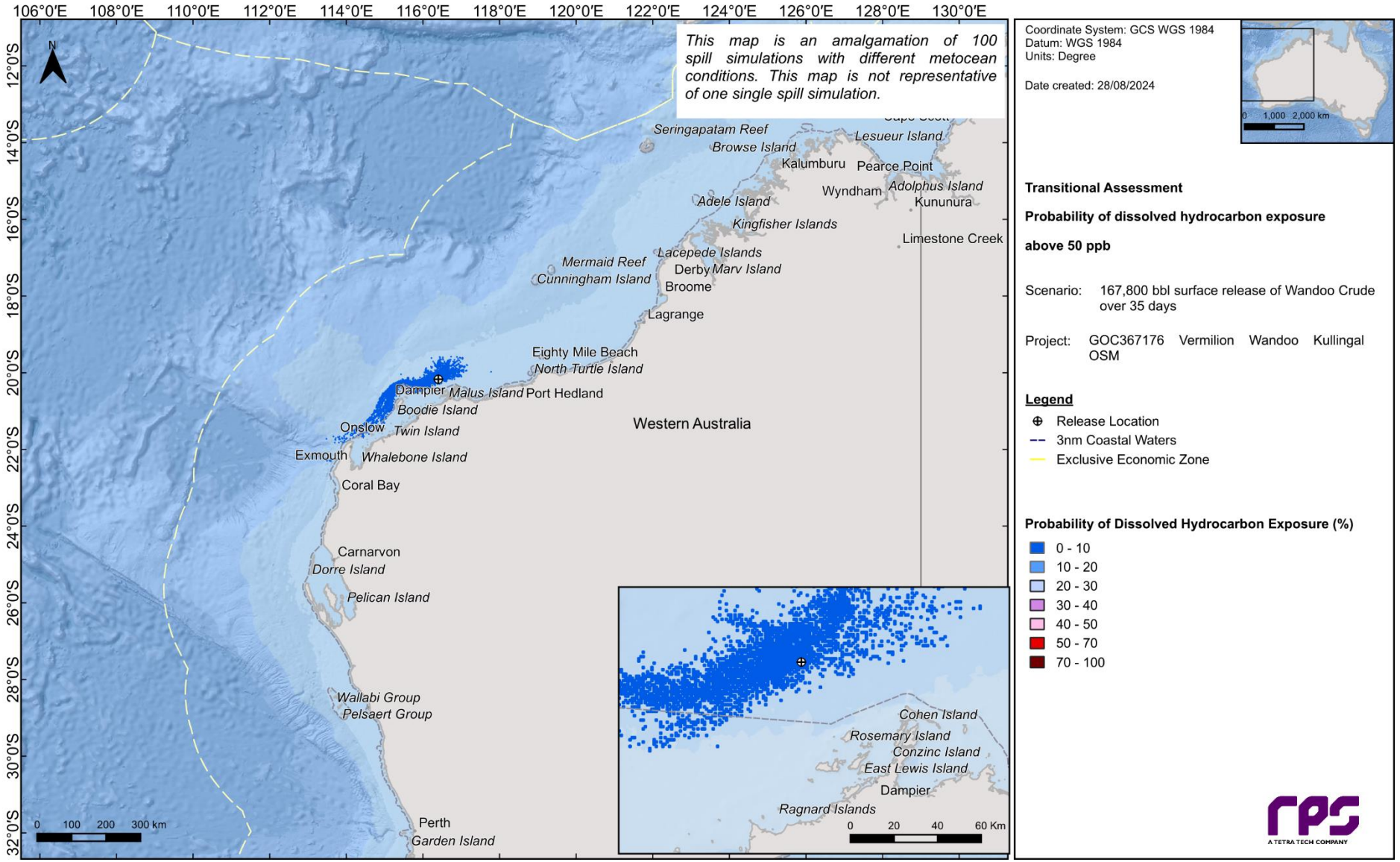

Figure 13.48 Probability of dissolved hydrocarbon exposure at, or above, 50 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

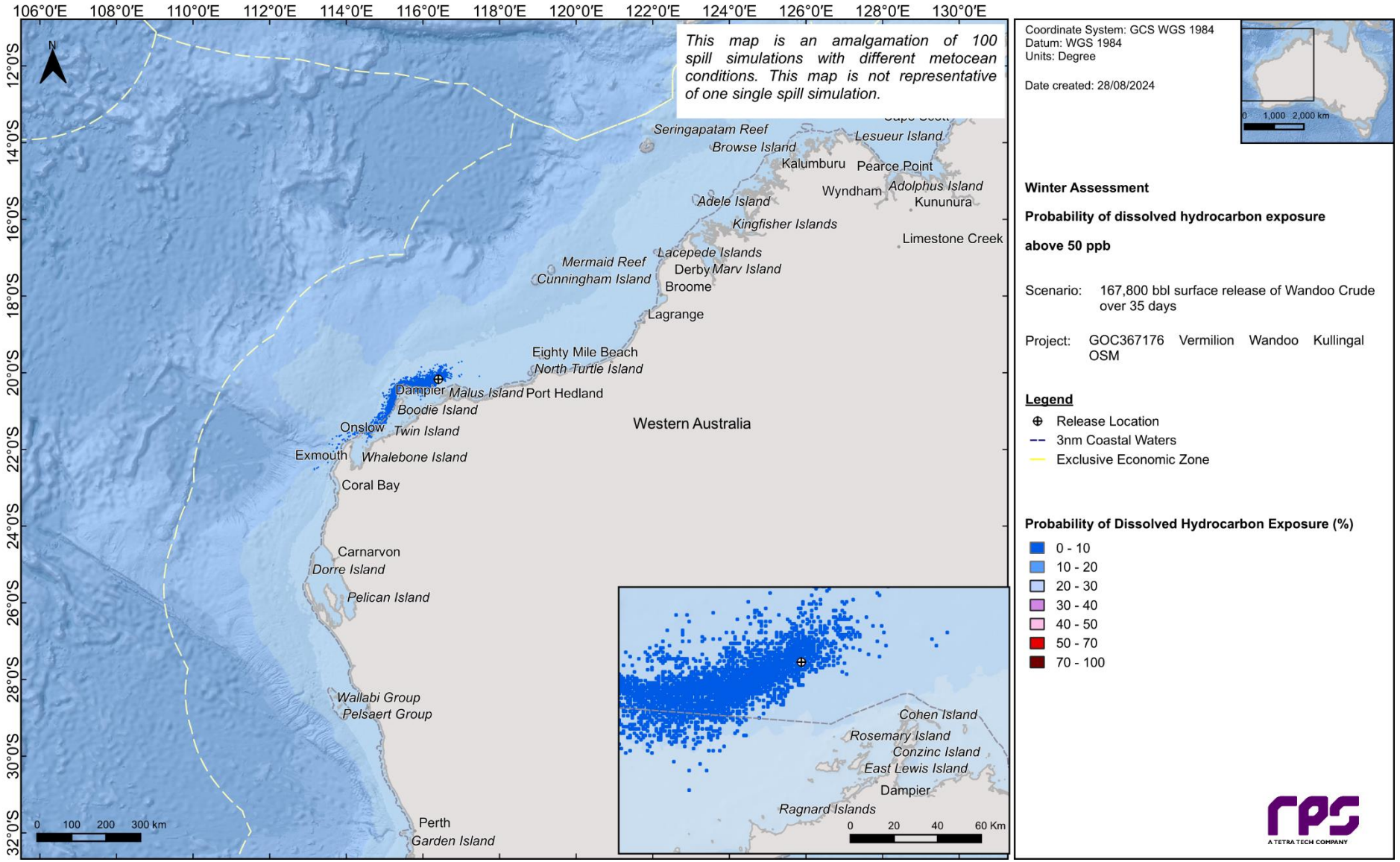

Figure 13.49 Probability of dissolved hydrocarbon exposure at, or above, 50 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

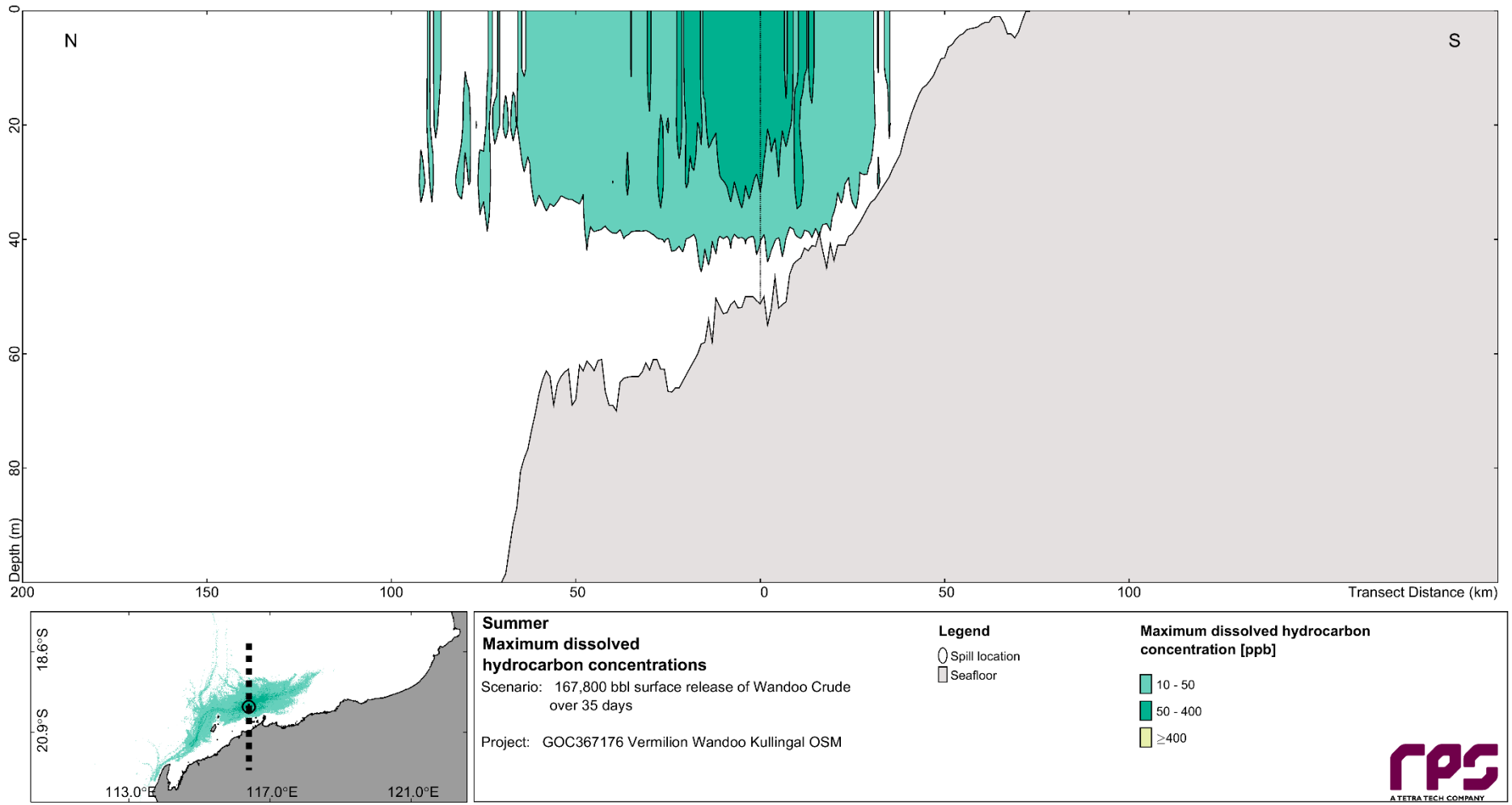

Figure 13.50 North-south cross-section transect of dissolved hydrocarbon concentrations exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

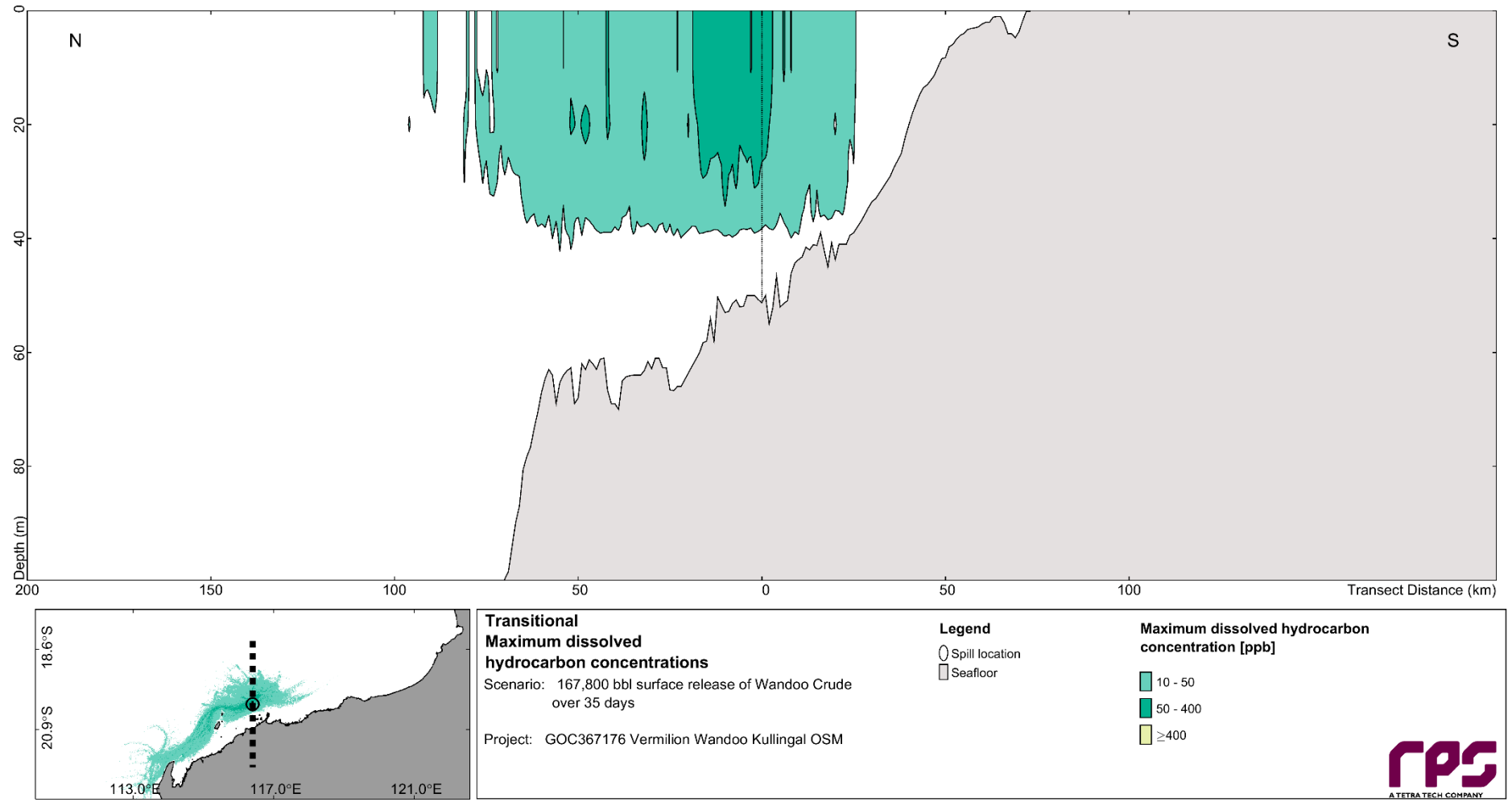

Figure 13.51 North-south cross-section transect of dissolved hydrocarbon concentrations exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

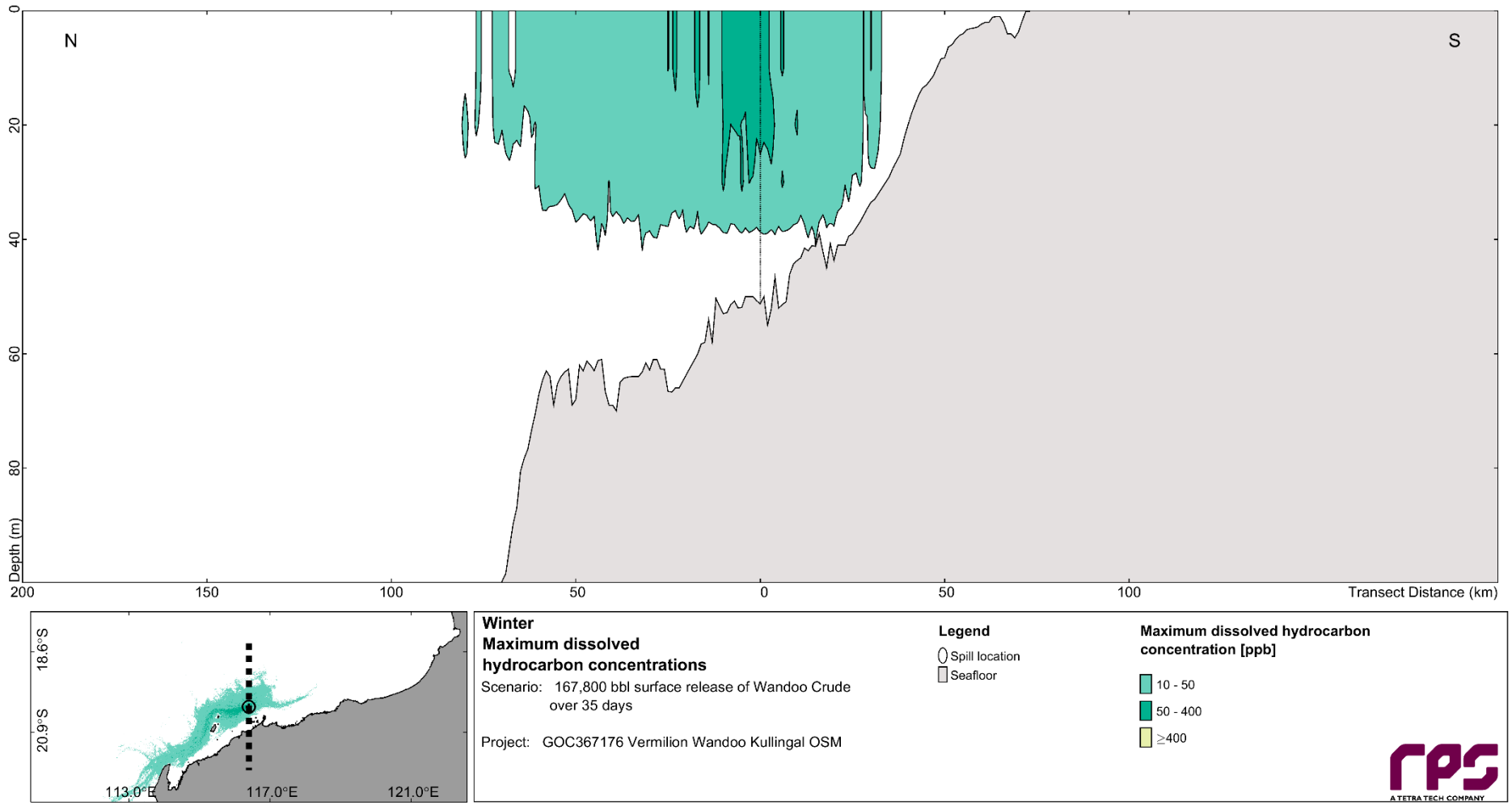

Figure 13.52 North-south cross-section transect of dissolved hydrocarbon concentrations exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

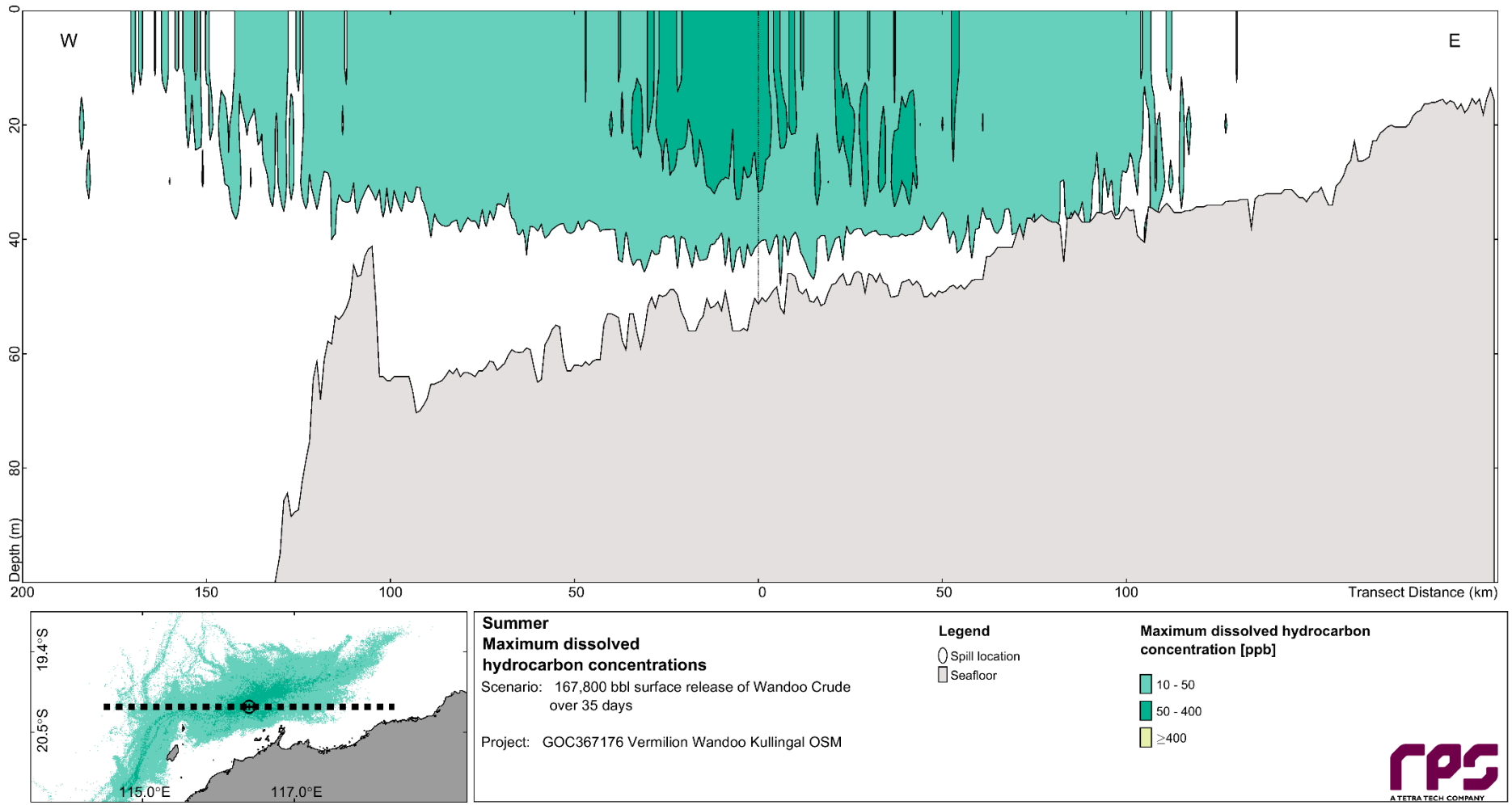

Figure 13.53 East-west cross-section transect of dissolved hydrocarbon concentrations exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

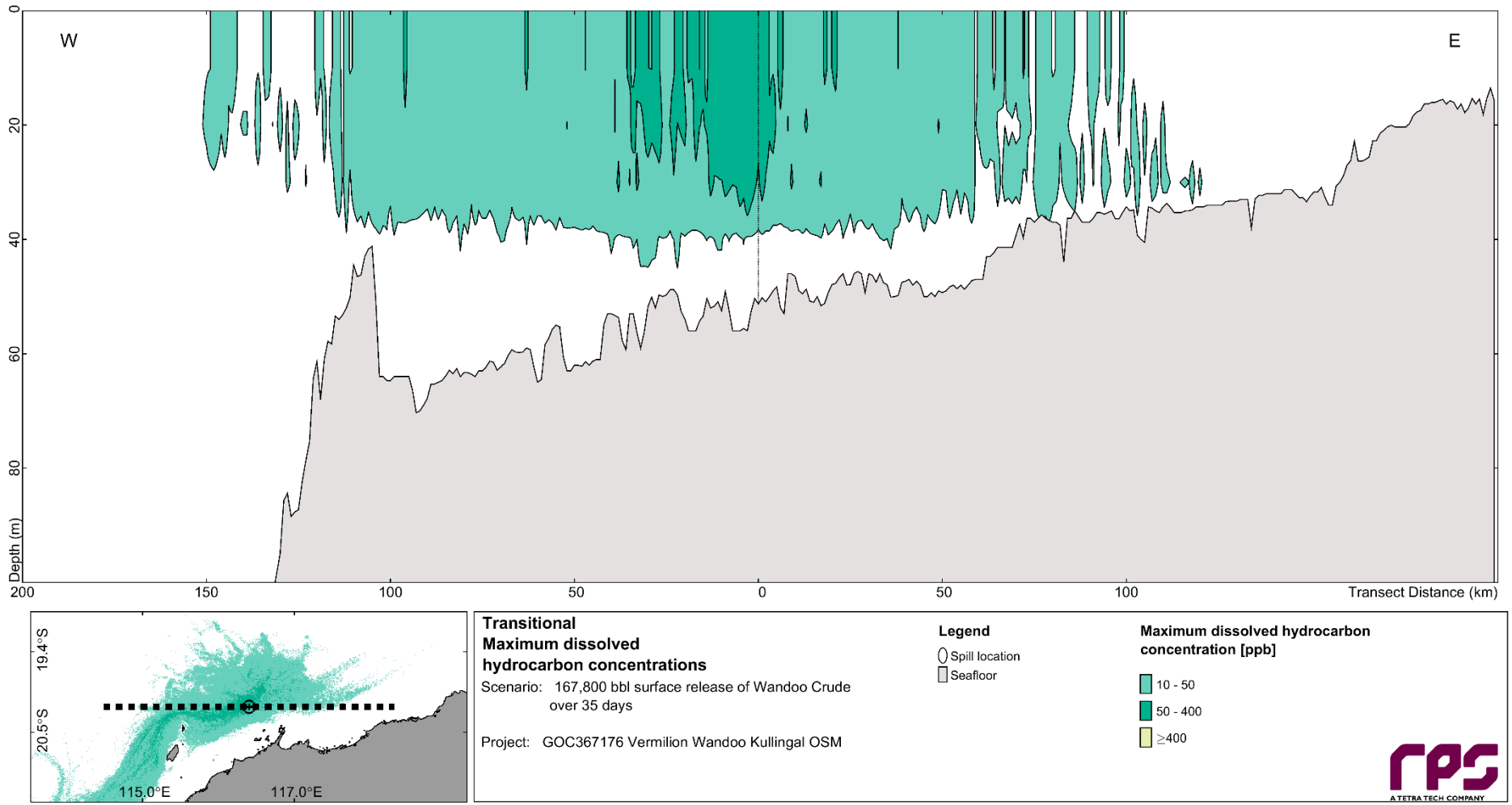

Figure 13.54 East-west cross-section transect of dissolved hydrocarbon concentrations exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

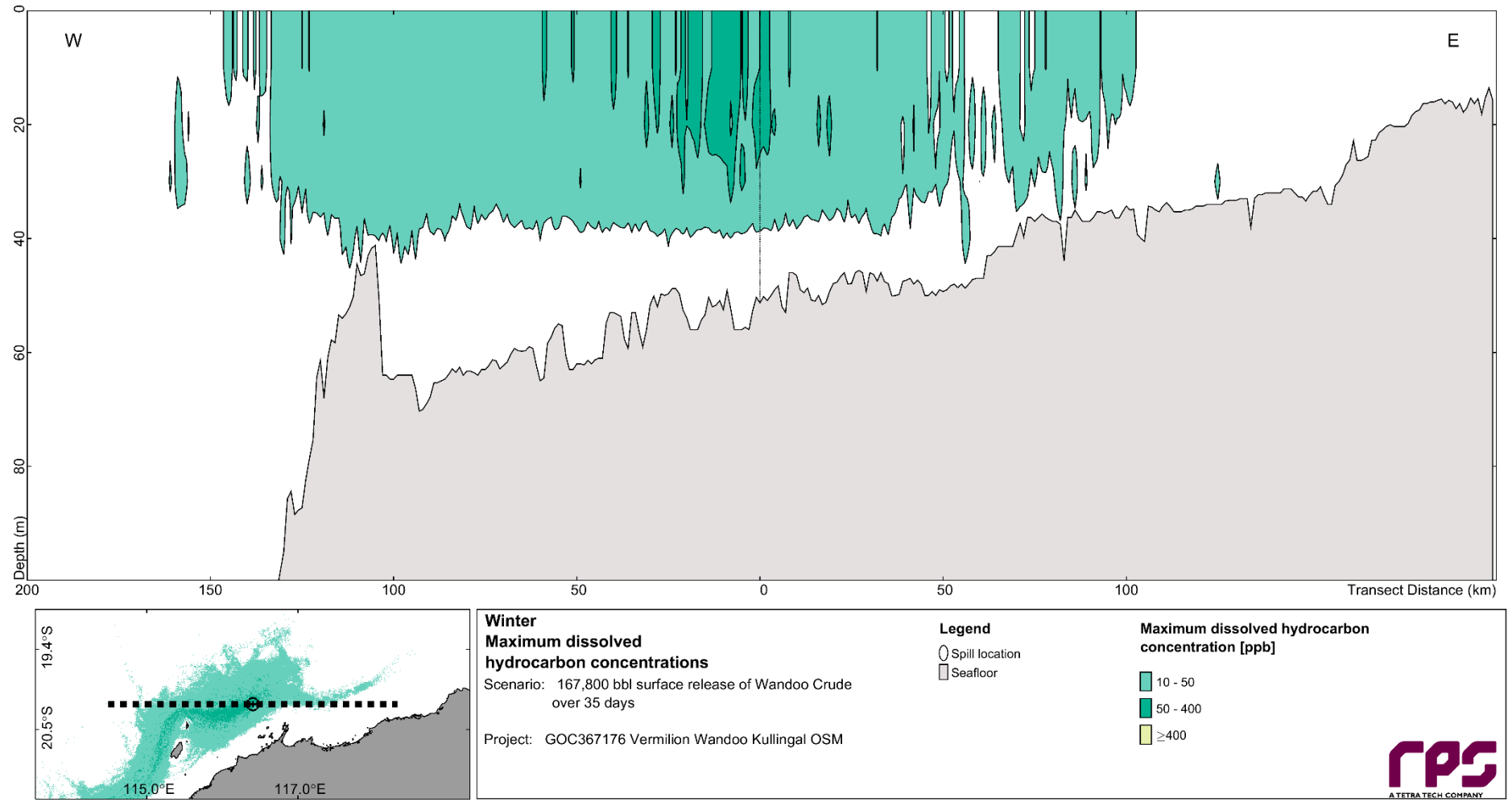

Figure 13.55 East-west cross-section transect of dissolved hydrocarbon concentrations exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

13.1.4.2 Entrained Hydrocarbons

Table 13.9 summarises the maximum distances from the release location to entrained hydrocarbon thresholds for each season. Concentrations exceeding 10 ppb may potentially extend up to 1,302 km from the release location. As the threshold increases to 100 ppb, the maximum distance decreases to 1,037 km.

Table 13.10 summarises the receptors exposed to entrained hydrocarbons per season (either at, or above, receptors in the water column).

For spills commencing during the summer months, the Glomar Shoals KEF recorded the highest probability (94%) of exposure to concentrations at, or above, 10 ppb, while the Montebello AMP recorded the highest probability of exposure for transitional (91%) and winter (99%) conditions. The shortest time to exposure at, or above, 10 ppb was recorded for the Montebello AMP with times of 21 hours during summer, 23 hours during transitional conditions, and 21 hours during winter. The highest recorded concentration, 3,007 ppb, occurred at Montebello AMP during winter.

Figure 13.56 to Figure 13.58 illustrate the zones of exposure to entrained hydrocarbons for each season, whilst Figure 13.59 to Figure 13.70 display the minimum exposure times and the probability of exposure to these hydrocarbons.

Seasonal cross-sectional transects (north-south and east-west) of the maximum entrained hydrocarbons in the vicinity of the release site, are presented in Figure 13.71 to Figure 13.76.

Table 13.9 Maximum distances from the release location to entrained hydrocarbon exposure thresholds following a surface LOWC at Kullingal. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Entrained hydrocarbon exposure thresholds	
		10 ppb	100 ppb
Summer	Maximum distance (km) from release location	1,176	527
	Direction	Southwest	Southwest
Transitional	Maximum distance (km) from release location	1,302	1,037
	Direction	Southwest	Southwest
Winter	Maximum distance (km) from release location	1,224	574
	Direction	Southwest	Southwest

Table 13.10 Receptors predicted to be exposed by entrained hydrocarbons following a surface LOWC at Kullingal. Results were calculated from100 spill simulations per season.

Category	Name	Summer						Transitional						Winter					
		Probability (%) of entrained hydrocarbon concentration		Minimum time to receptor waters (hours) at		Maximum entrained hydrocarbon concentration (ppb)		Probability (%) of entrained hydrocarbon concentration		Minimum time to receptor waters (hours) at		Maximum entrained hydrocarbon concentration (ppb)		Probability (%) of entrained hydrocarbon concentration		Minimum time to receptor waters (hours) at		Maximum entrained hydrocarbon concentration (ppb)	
		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb	averaged over all replicate spills	in the worst replicate	≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb	averaged over all replicate spills	in the worst replicate	≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb	averaged over all replicate spills	in the worst replicate
AMP	Abrolhos	1	NC	1,081	NC	<1	28	6	1	831	1,043	3	156	3	NC	986	NC	<1	17
	Argo-Rowley Terrace	7	NC	678	NC	2	46	18	NC	624	NC	4	38	15	NC	410	NC	5	59
	Carnarvon Canyon	3	NC	617	NC	<1	18	8	NC	740	NC	3	39	10	NC	762	NC	4	83
	Dampier	47	15	77	166	38	281	22	3	203	274	14	162	19	NC	314	NC	5	51
	Gascoyne	32	2	310	616	13	448	66	35	246	328	120	906	68	43	234	238	166	1,153
	Mermaid Reef	3	NC	1,010	NC	<1	23	NC	NC	NC	NC	NC	NC	1	NC	1,261	NC	<1	13
	Montebello	80	64	21	21	305	1,521	91	82	23	26	519	1,418	99	96	21	24	637	3,007
EEZ	Indonesia	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2	NC	1,018	NC	<1	16
IPA	Nyangumarta Warrarn	4	NC	722	NC	2	27	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
KEF	Ancient coastline at 125 m depth contour	68	20	161	186	76	1,133	76	46	138	205	163	1,557	90	54	110	125	291	2,369

	Canyons linking the Argo Abyssal Plain with the Scott Plateau	38	7	266	395	27	445	62	44	209	272	126	1,592	1	NC	1,294	NC	<1	11
	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	77	50	172	175	237	1,633
	Commonwealth waters adjacent to Ningaloo Reef	26	4	319	619	12	392	58	46	257	339	112	752	72	47	219	229	178	1,304
	Continental Slope Demersal Fish Communities	67	13	203	484	59	1,349	76	36	145	226	129	1,416	80	46	142	233	166	1,864
	Exmouth Plateau	24	NC	413	NC	6	84	50	6	381	555	22	207	57	12	350	367	32	382
	Glomar Shoals	94	61	73	94	164	732	67	42	80	105	125	608	68	42	63	72	219	1,149
	Mermaid Reef and Commonwealth waters surrounding Rowley Shoals	5	NC	678	NC	2	46	4	NC	749	NC	2	41	8	NC	648	NC	3	53
	Wallaby Saddle	NC	NC	NC	NC	NC	NC	1	NC	1,263	NC	<1	21	2	NC	990	NC	<1	17

	Western demersal slope and associated fish communities	2	NC	778	NC	<1	39	15	1	666	953	4	187	5	NC	879	NC	2	35
MP	Barrow Island	46	11	104	115	30	474	69	42	114	123	91	415	86	46	85	121	126	537
	Eighty Mile Beach	26	NC	410	NC	8	65	5	NC	502	NC	2	28	2	NC	1,185	NC	<1	14
	Montebello Islands	58	35	79	83	208	1,942	76	58	60	66	294	2,062	93	78	57	60	622	2,586
	Ningaloo	26	4	319	619	12	392	58	46	257	339	112	752	72	47	219	229	178	1,304
	Rowley Shoals	3	NC	679	NC	2	33	3	NC	792	NC	<1	31	8	NC	670	NC	3	53
NR	Barrow Island	12	NC	338	NC	4	66	24	NC	196	NC	8	64	51	NC	262	NC	15	61
	Great Sandy Island	11	3	227	855	7	139	11	NC	585	NC	4	42	55	NC	257	NC	18	95
	Lowendal Islands	22	9	149	484	33	588	37	21	134	147	48	314	79	37	153	188	91	351
	Thevenard Island	10	NC	498	NC	4	73	43	9	217	493	22	144	57	2	188	408	21	160
RAM SAR	Eighty-mile Beach	8	NC	646	NC	2	29	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
RSB	Ashworth Shoal	2	NC	1,247	NC	<1	15	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Australind Shoal	8	NC	897	NC	2	34	2	NC	755	NC	2	21	8	NC	301	NC	5	36
	Barrow Island Reefs and Shoals	11	3	226	851	8	147	14	NC	360	NC	4	44	59	NC	256	NC	19	96
	Baylis Patches	4	NC	845	NC	<1	28	23	NC	680	NC	6	34	8	NC	495	NC	4	27
	Bennett Shoal	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	818	NC	2	13

	Beryl Reef	4	NC	909	NC	2	27	NC	NC	NC	NC	NC	NC	27	NC	263	NC	8	42
	Brewis Reef	10	NC	807	NC	4	46	43	NC	216	NC	14	81	56	3	175	421	23	114
	Camplin Shoal	NC	NC	NC	NC	NC	NC	2	NC	1,320	NC	<1	12	1	NC	757	NC	2	16
	Clerke Reef	2	NC	799	NC	<1	20	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Cod Bank	20	2	112	884	9	114	13	NC	470	NC	4	92	6	NC	620	NC	2	20
	Combe Reef	6	NC	794	NC	3	56	42	3	470	763	25	171	62	NC	235	NC	21	78
	Cooper Shoal	NC	NC	NC	NC	NC	NC	1	NC	1,344	NC	<1	12	1	NC	734	NC	2	18
	Courtenay Shoal	17	NC	153	NC	6	50	12	NC	462	NC	4	47	1	NC	1,193	NC	<1	11
	Dailey Shoal	17	1	485	721	9	106	53	28	292	421	64	346	67	30	208	210	75	365
	Dockrell Reef	5	NC	529	NC	2	32	1	NC	898	NC	<1	19	NC	NC	NC	NC	NC	NC
	Eliassen Rocks	3	NC	527	NC	<1	19	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Exmouth Reef	4	NC	896	NC	2	52	30	NC	508	NC	9	49	46	NC	260	NC	13	50
	Fairway Reef	9	NC	696	NC	3	43	43	3	422	719	20	110	58	NC	211	NC	21	88
	Flinders Shoal	5	1	266	1,091	4	108	5	NC	1,172	NC	2	25	12	NC	399	NC	4	20
	Fortescue Reef	6	NC	527	NC	2	24	NC	NC	NC	NC	NC	NC	8	NC	278	NC	3	24
	Glennie Patches	6	NC	890	NC	2	22	1	NC	756	NC	<1	13	4	NC	447	NC	3	41
	Glomar Shoal	77	33	152	222	84	450	51	25	140	154	54	330	45	22	108	148	72	699
	Gorgon Patch	3	NC	1,000	NC	<1	22	NC	NC	NC	NC	NC	NC	5	NC	393	NC	2	35
	Hammersley Shoal	31	11	154	177	24	236	17	NC	325	NC	8	79	3	NC	531	NC	2	30
	Hastings Shoal	3	NC	1,017	NC	<1	14	NC	NC	NC	NC	NC	NC	5	NC	393	NC	2	27
	Hayman Rock	4	NC	832	NC	2	25	11	NC	628	NC	4	16	15	NC	287	NC	6	43

	Hayward Rock	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	848	NC	<1	24
	Herald Reef	3	NC	904	NC	2	61	NC	NC	NC	NC	NC	NC	5	NC	408	NC	2	26
	Hood Reef	13	NC	660	NC	5	48	50	16	409	421	42	276	62	7	209	330	33	269
	Imperieuse Reef	3	NC	680	NC	2	22	3	NC	797	NC	<1	27	6	NC	695	NC	3	53
	Inner Northwest Patch	5	NC	994	NC	2	18	NC	NC	NC	NC	NC	NC	5	NC	414	NC	3	39
	Koolinda Patch	3	NC	1,014	NC	<1	19	NC	NC	NC	NC	NC	NC	5	NC	393	NC	2	32
	Lightfoot Reef	6	NC	280	NC	3	70	4	NC	1,184	NC	2	24	2	NC	941	NC	2	13
	Little Shoals	4	NC	282	NC	4	99	1	NC	1,244	NC	<1	14	5	NC	402	NC	3	25
	Locker Reef	4	NC	796	NC	2	23	14	NC	618	NC	4	18	15	NC	287	NC	7	53
	Madeleine Shoals	46	11	116	166	36	283	20	2	256	310	14	128	19	NC	324	NC	5	41
	Manicom Bank	2	NC	1,019	NC	<1	12	NC	NC	NC	NC	NC	NC	4	NC	528	NC	2	27
	Mardie Rock	3	NC	1,004	NC	<1	17	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	McLennan Bank	13	2	117	897	8	115	6	NC	507	NC	3	57	23	NC	155	NC	10	67
	Meda Reef	6	NC	514	NC	3	57	NC	NC	NC	NC	NC	NC	4	NC	798	NC	2	13
	Mermaid Reef	3	NC	1,010	NC	<1	17	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Miles Shoal	6	NC	901	NC	2	18	NC	NC	NC	NC	NC	NC	4	NC	536	NC	3	26
	Montebello Shoals	46	24	85	103	80	596	61	42	77	115	124	589	93	63	74	91	178	746
	Moresby Shoals	4	NC	319	NC	3	79	NC	NC	NC	NC	NC	NC	5	NC	400	NC	2	28
	Nares Rock	3	NC	893	NC	3	97	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Ningaloo Reef	10	2	586	687	5	144	49	18	384	398	46	372	58	8	257	470	31	372

	North West Reef	17	2	119	505	9	124	50	11	473	583	36	226	60	1	239	581	25	114
	O'Grady Shoal	9	NC	490	NC	3	38	1	NC	909	NC	<1	16	11	NC	399	NC	3	27
	Otway Reef	10	NC	541	NC	4	59	46	11	424	625	39	349	65	7	212	345	36	167
	Outtrim Patches	22	4	367	700	16	259	53	42	258	421	91	312	71	41	206	208	99	551
	Paroo Shoal	4	NC	900	NC	<1	17	NC	NC	NC	NC	NC	NC	4	NC	533	NC	2	20
	Pearl Reef	4	NC	919	NC	<1	16	14	NC	760	NC	4	27	21	NC	283	NC	6	41
	Penguin Bank	25	6	153	431	21	256	58	24	142	245	78	361	77	48	149	172	100	375
	Poivre Reef	19	7	153	166	18	278	55	10	161	524	38	273	75	26	138	219	55	217
	Rankin Bank	66	7	244	435	37	238	71	9	239	309	39	202	80	32	165	359	89	413
	Ripple Shoals	12	3	179	874	8	188	16	NC	306	NC	5	45	50	NC	299	NC	16	78
	Roller Shoal	3	NC	896	NC	<1	12	NC	NC	NC	NC	NC	NC	4	NC	534	NC	2	25
	Rosily Shoals	19	5	166	433	15	172	56	28	163	259	68	376	75	40	160	274	78	233
	Saladin Shoal	2	NC	1,015	NC	<1	13	NC	NC	NC	NC	NC	NC	4	NC	529	NC	2	21
	Santo Rock	7	NC	822	NC	2	33	25	NC	604	NC	7	35	24	NC	326	NC	10	90
	South East Reef	10	NC	526	NC	3	33	3	NC	718	NC	<1	18	NC	NC	NC	NC	NC	NC
	South West Reef	10	NC	505	NC	3	33	3	NC	532	NC	<1	15	4	NC	533	NC	<1	24
	Southwest Patch	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
	Spider Reef	6	NC	721	NC	2	30	36	NC	471	NC	10	52	48	NC	286	NC	12	64
	Sultan Reef	8	NC	869	NC	3	55	17	NC	305	NC	5	27	35	NC	189	NC	10	42
	Taunton Reef	10	2	205	998	6	151	21	NC	306	NC	5	30	42	NC	327	NC	13	59
	Tongue Shoals	6	NC	900	NC	2	25	NC	NC	NC	NC	NC	NC	5	NC	408	NC	4	43

	Trap Reef	14	NC	485	NC	7	98	44	13	204	484	44	291	66	2	175	383	30	155
	Tryal Rocks	58	36	81	88	109	782	82	61	70	78	173	791	93	80	51	56	310	2,012
	Vaughan Shoal	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	827	NC	2	24
	Ward Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	5	NC	394	NC	2	23
	Web Reef	4	NC	757	NC	2	27	30	NC	484	NC	9	51	50	NC	336	NC	12	46
	Weeks Shoal	3	NC	906	NC	2	25	NC	NC	NC	NC	NC	NC	4	NC	527	NC	2	36
	West Reef	4	NC	290	NC	3	100	1	NC	1,218	NC	<1	14	4	NC	399	NC	2	14
State and Territory Waters	WA	71	48	23	24	210	1,942	84	67	36	40	294	2,062	99	96	40	41	622	2,586

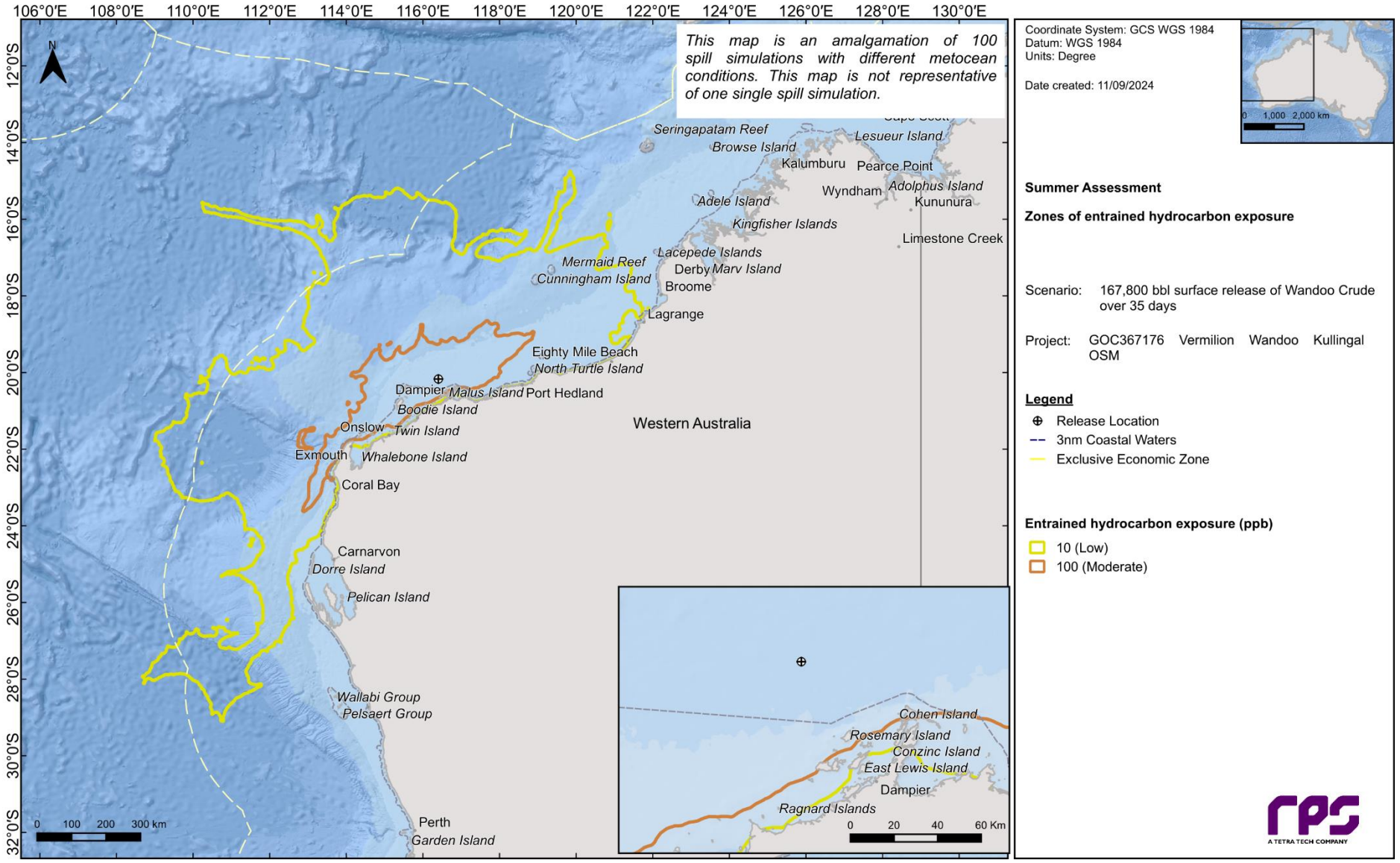

Figure 13.56 Predicted zones of entrained hydrocarbon exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

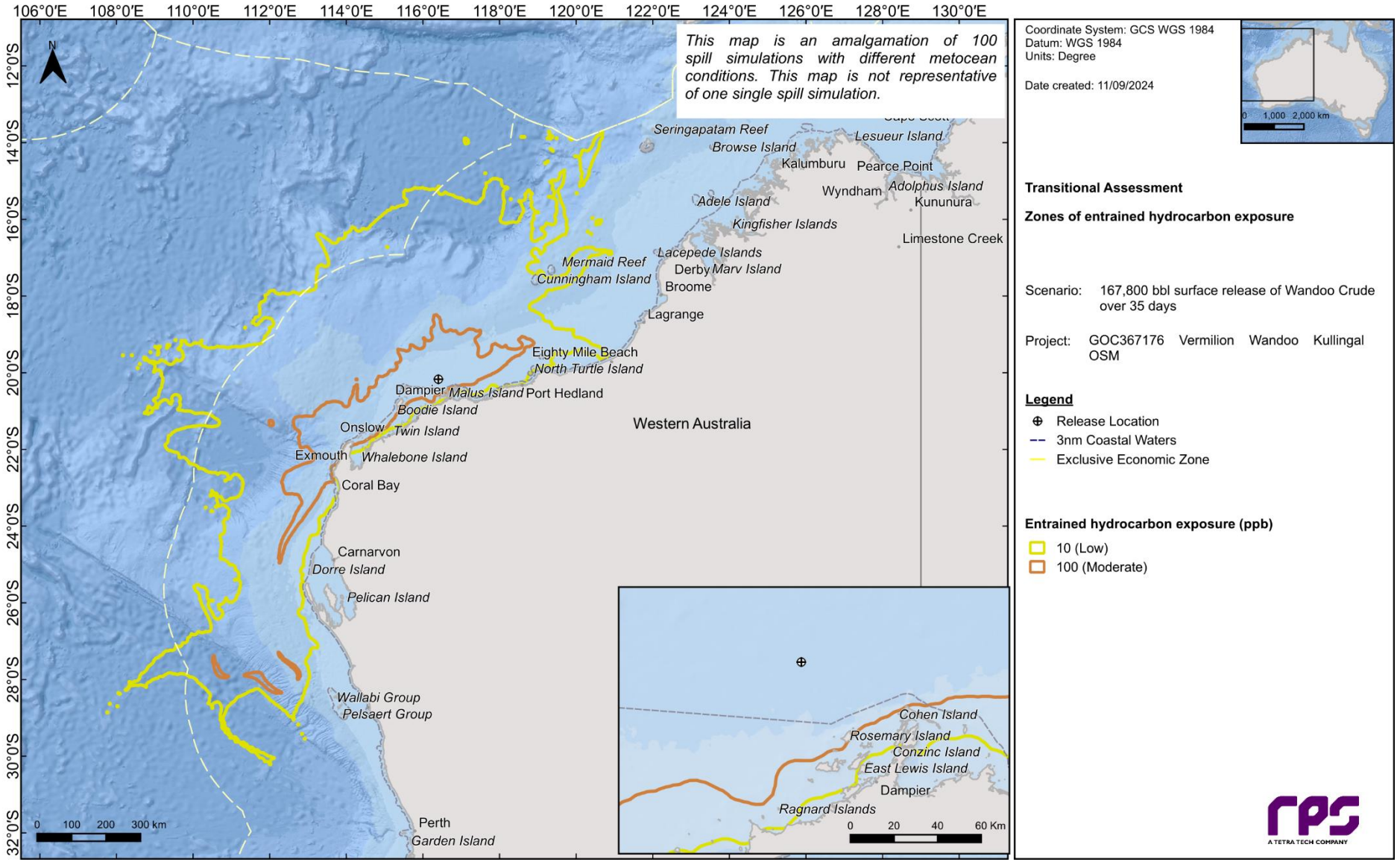

Figure 13.57 Predicted zones of entrained hydrocarbon exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

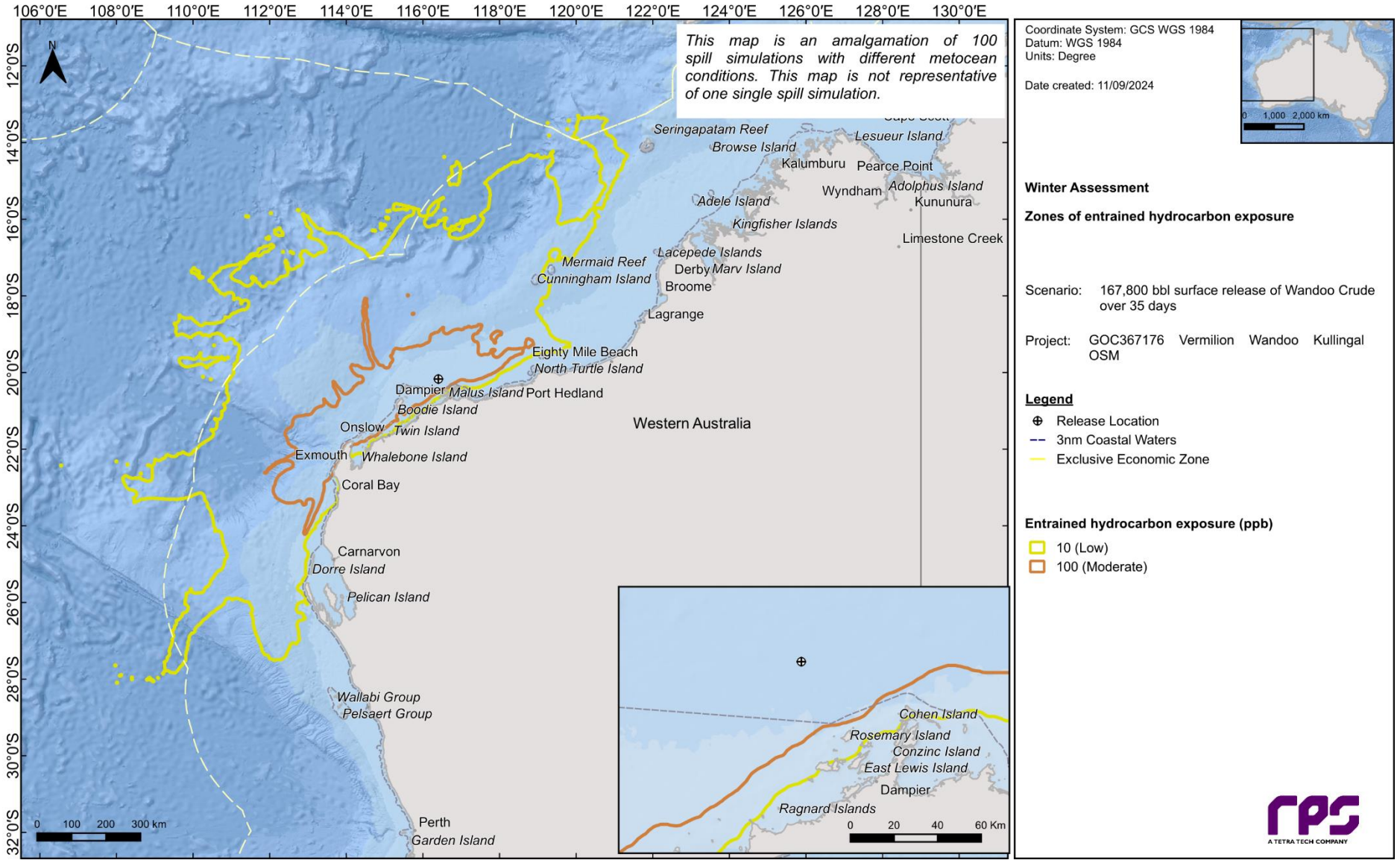

Figure 13.58 Predicted zones of entrained hydrocarbon exposure following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

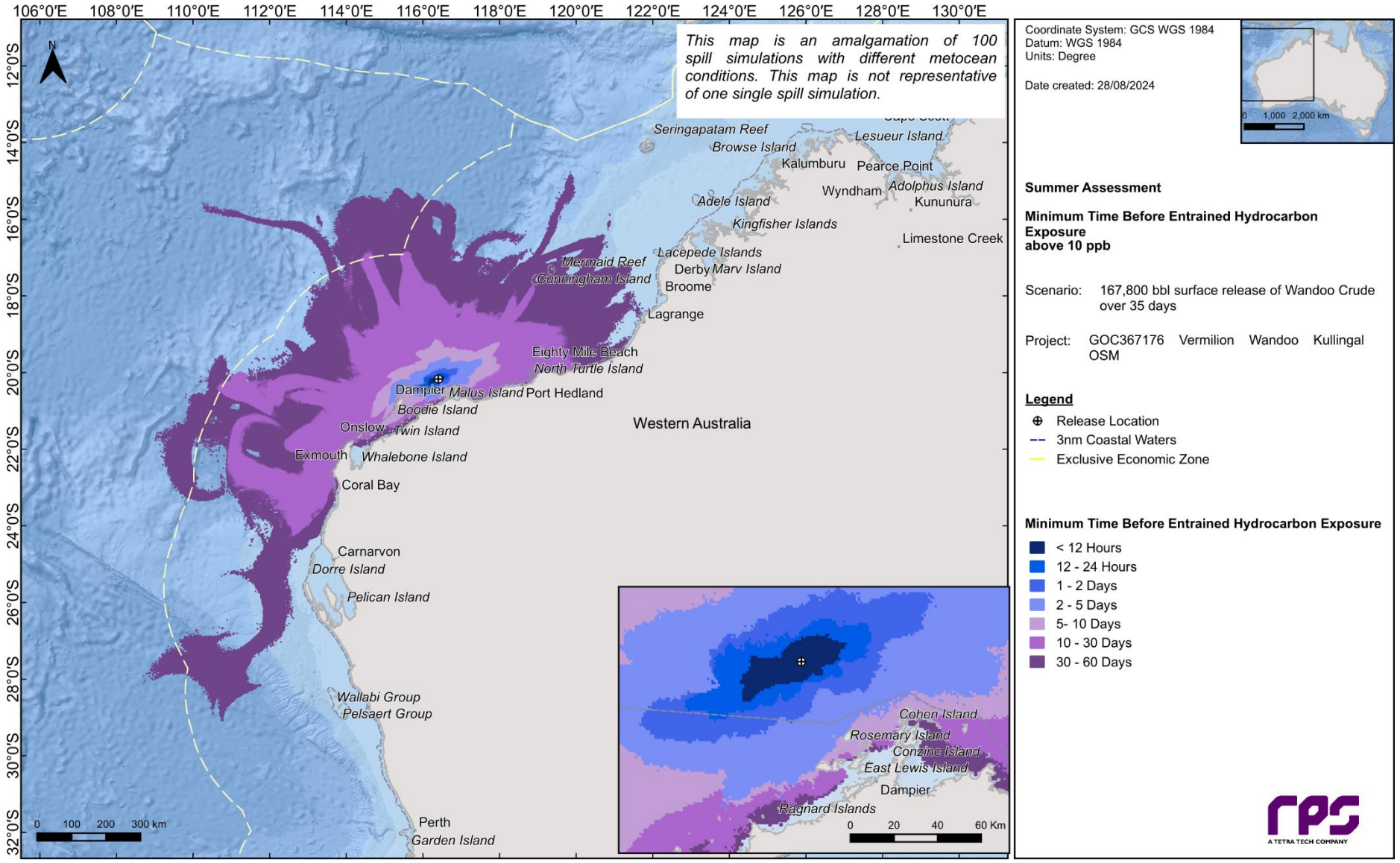

Figure 13.59 Minimum time before entrained hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

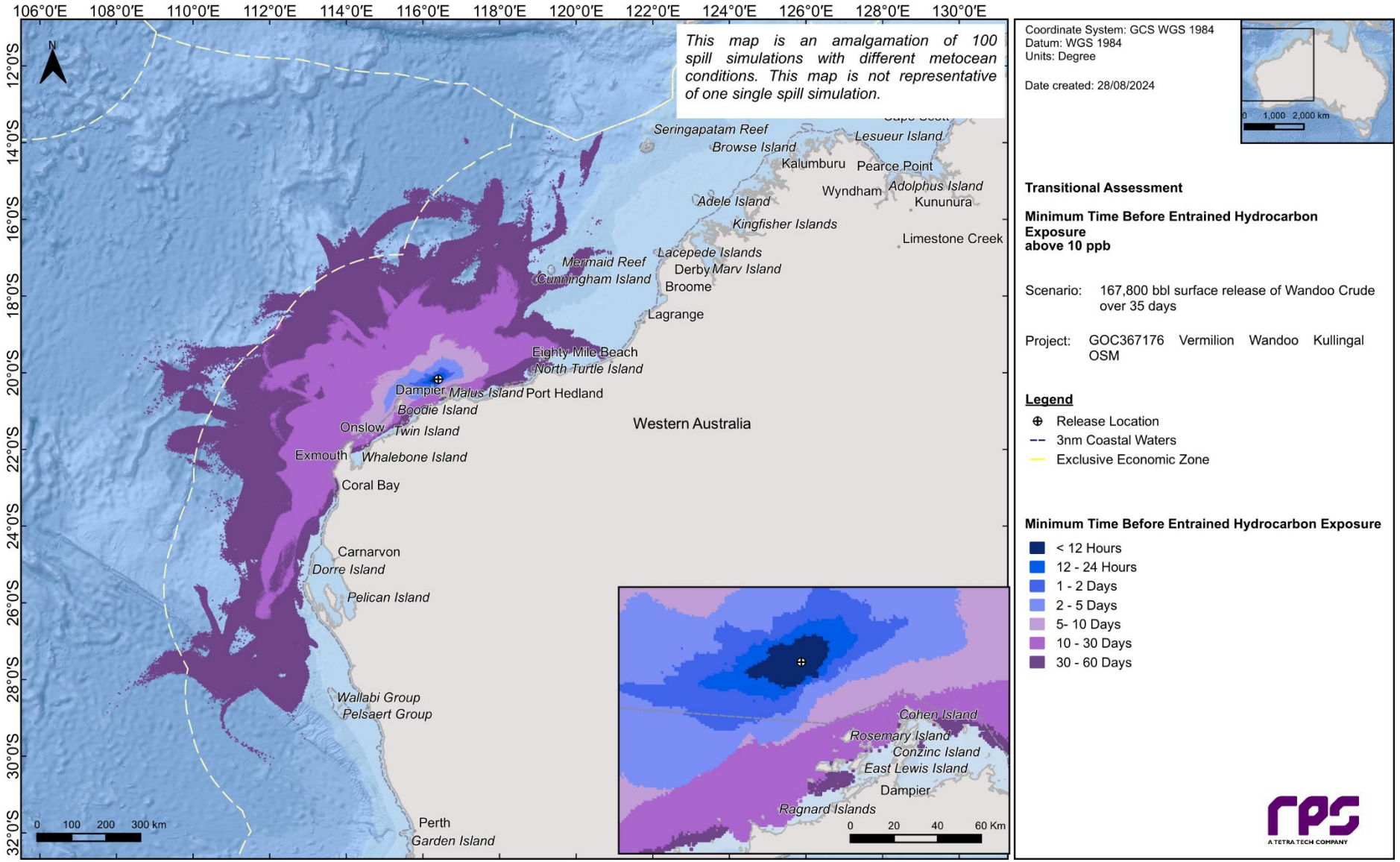

Figure 13.60 Minimum time before entrained hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

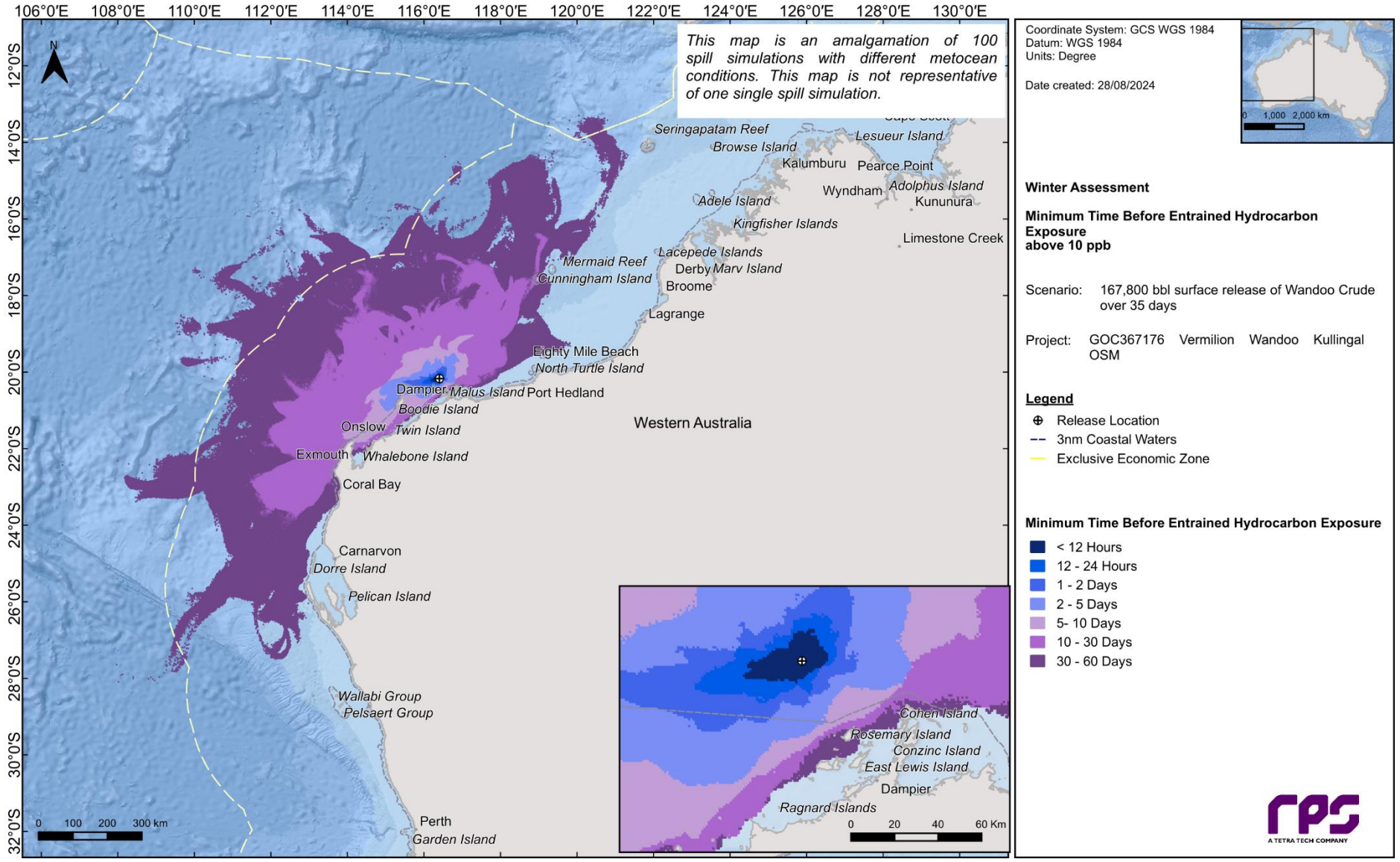

Figure 13.61 Minimum time before entrained hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

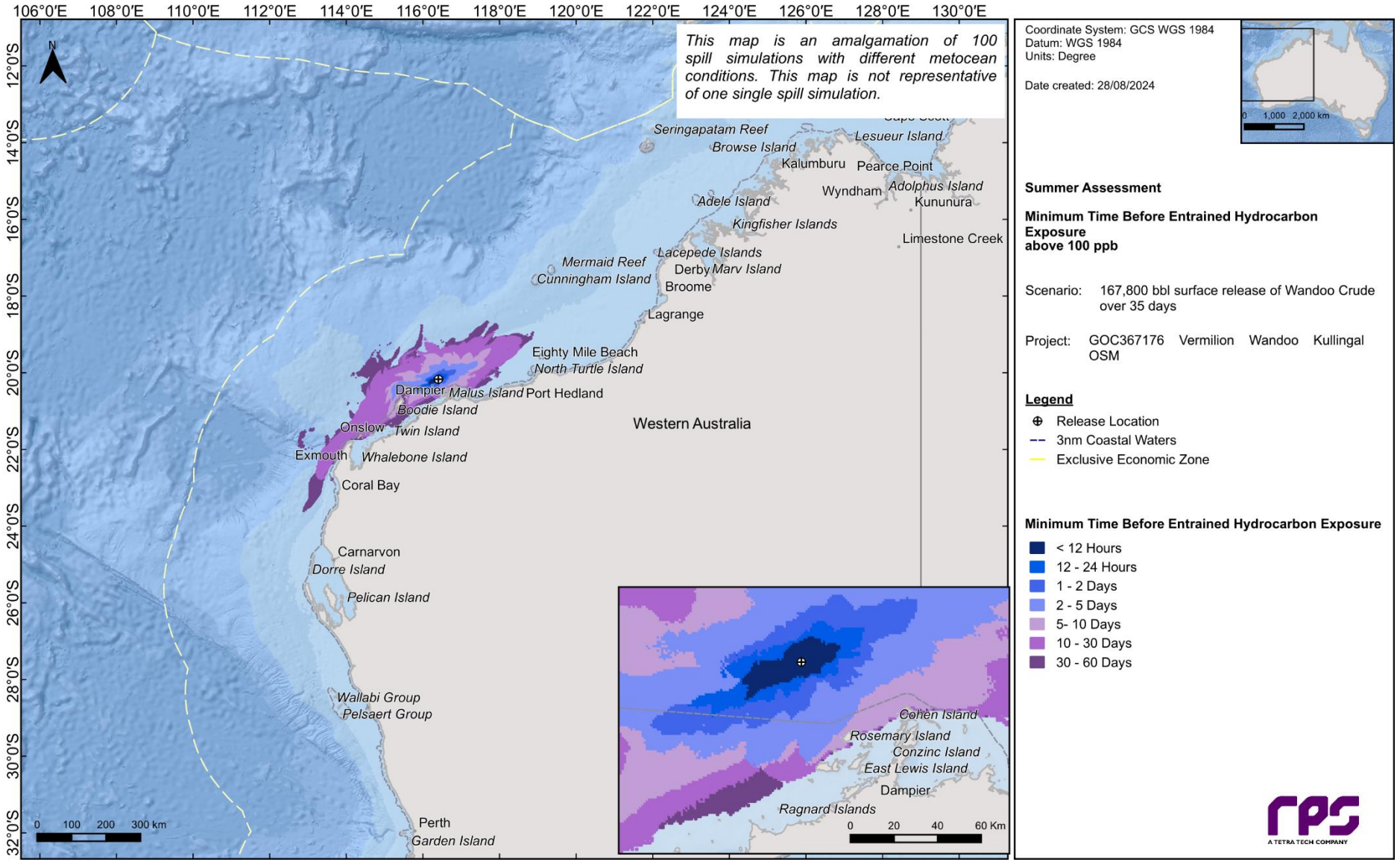

Figure 13.62 Minimum time before entrained hydrocarbon exposure at, or above, 100 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

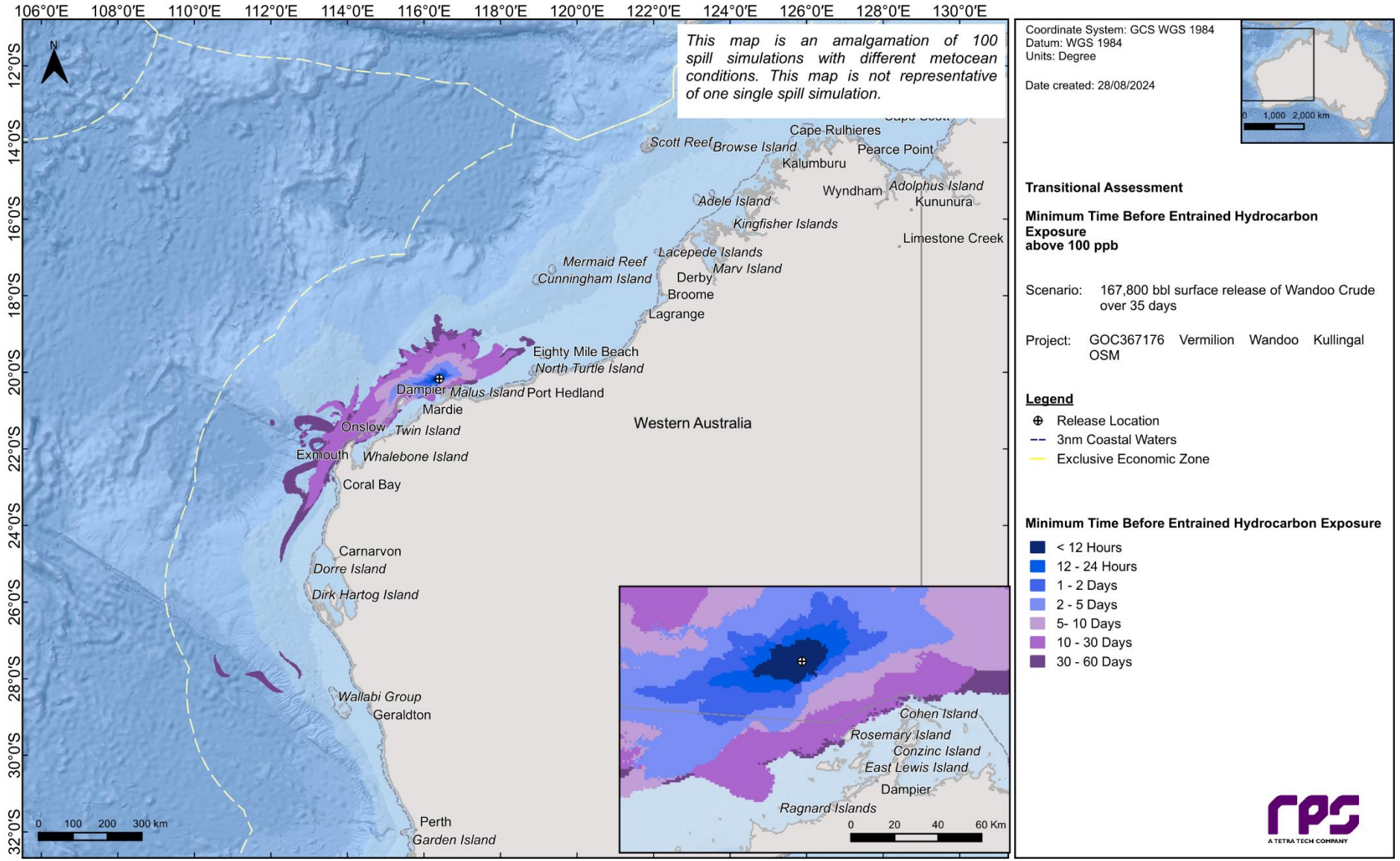

Figure 13.63 Minimum time before entrained hydrocarbon exposure at, or above, 100 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

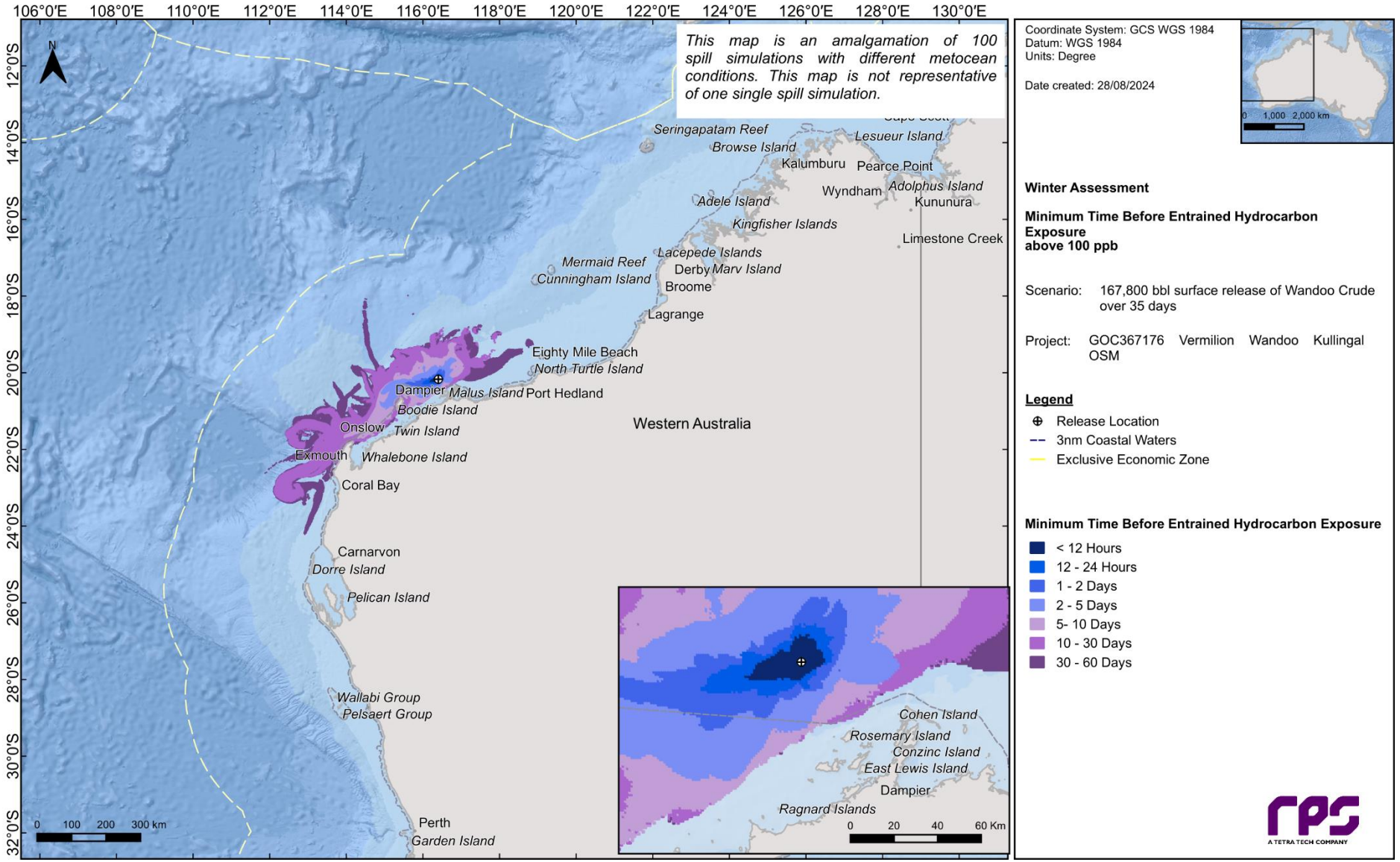

Figure 13.64 Minimum time before entrained hydrocarbon exposure at, or above, 100 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

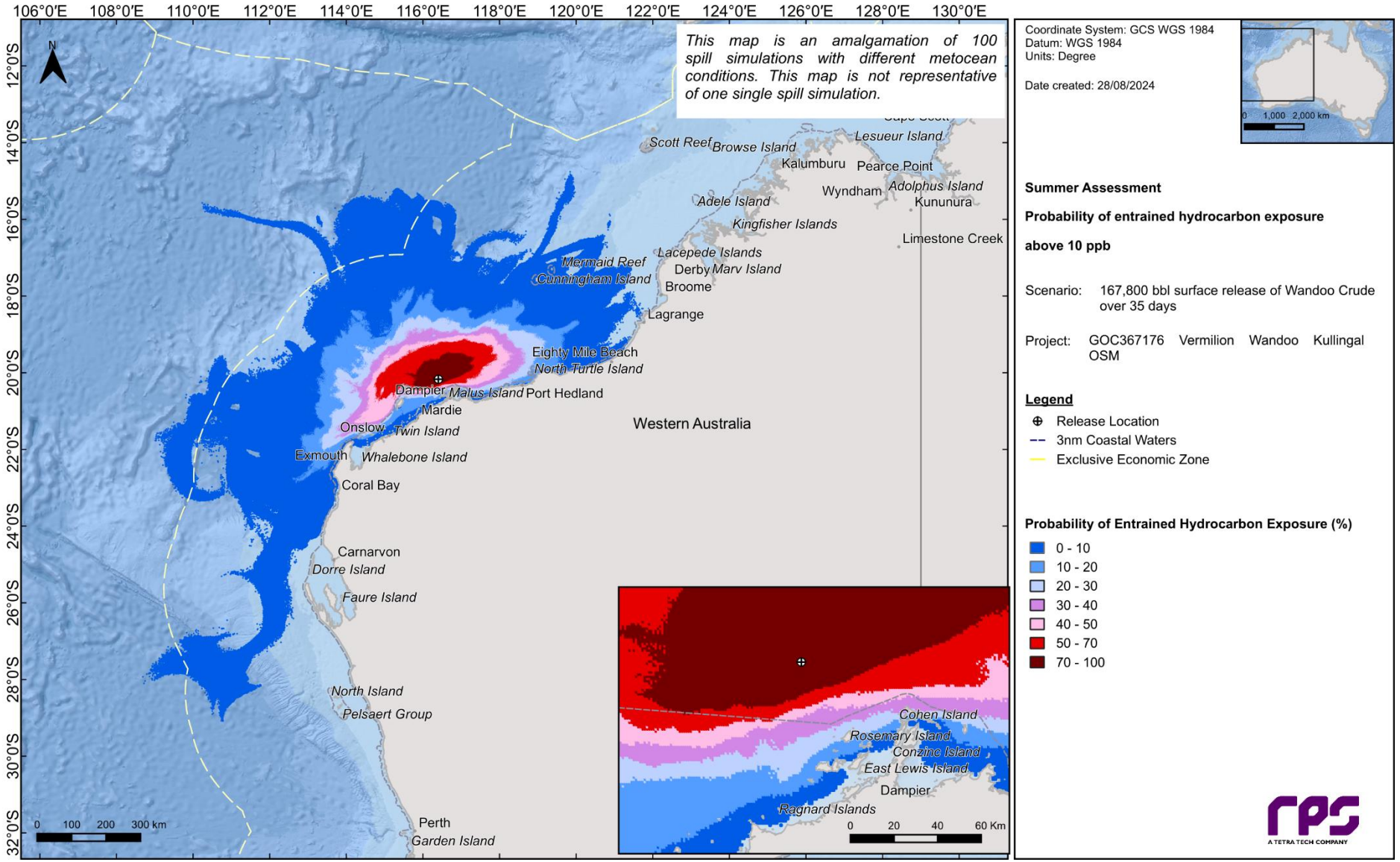

Figure 13.65 Probability of entrained hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

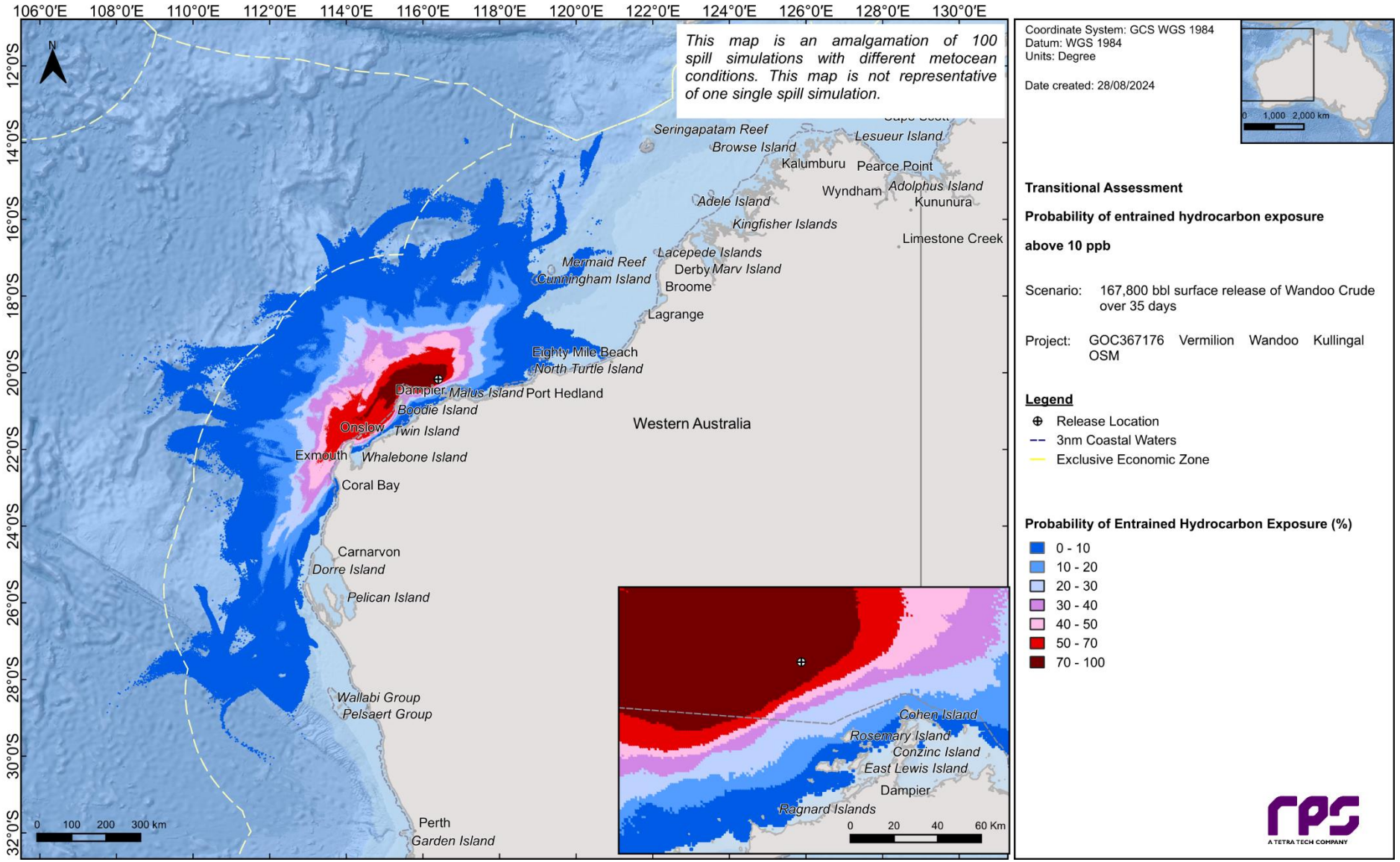

Figure 13.66 Probability of entrained hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

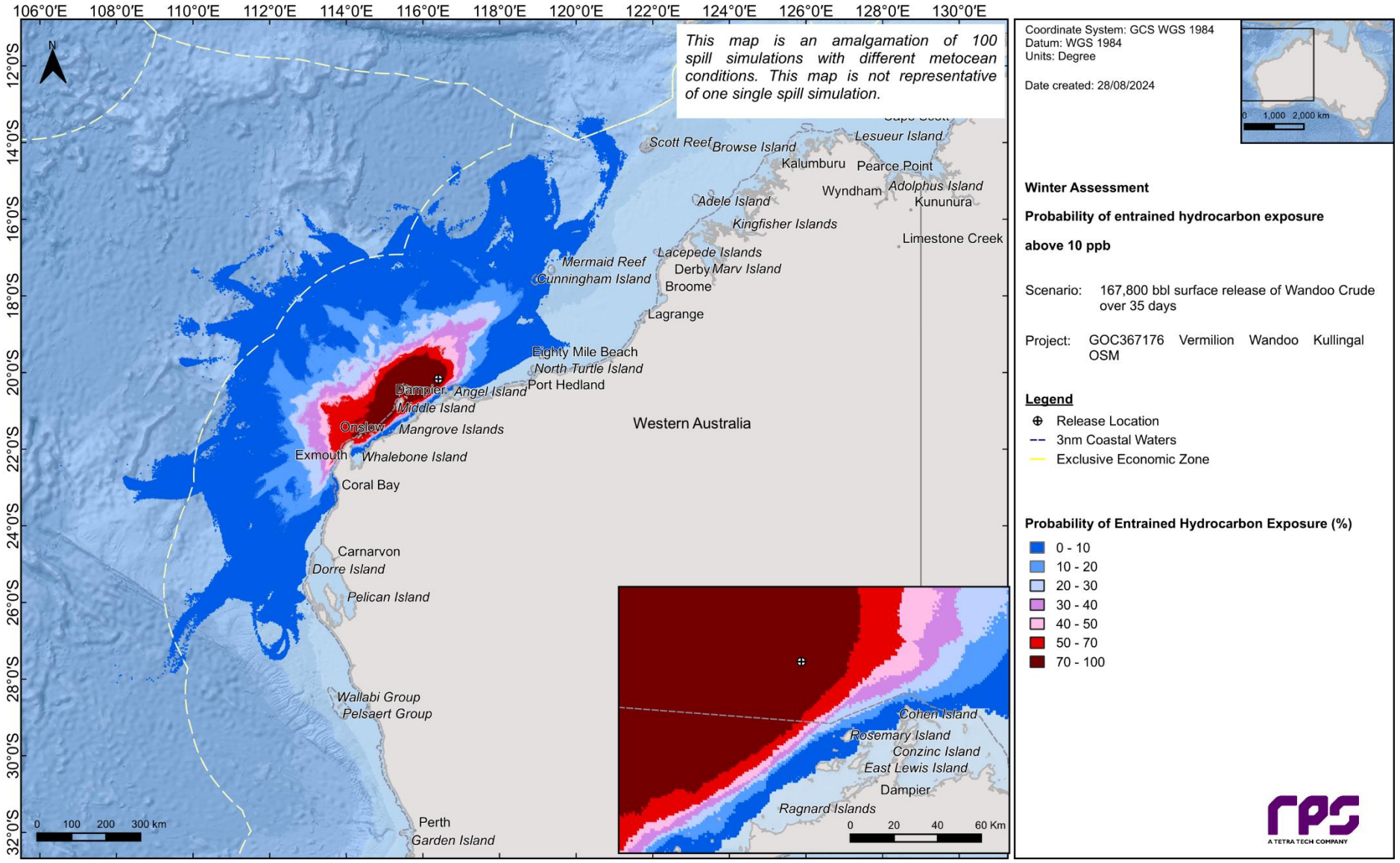

Figure 13.67 Probability of entrained hydrocarbon exposure at, or above, 10 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

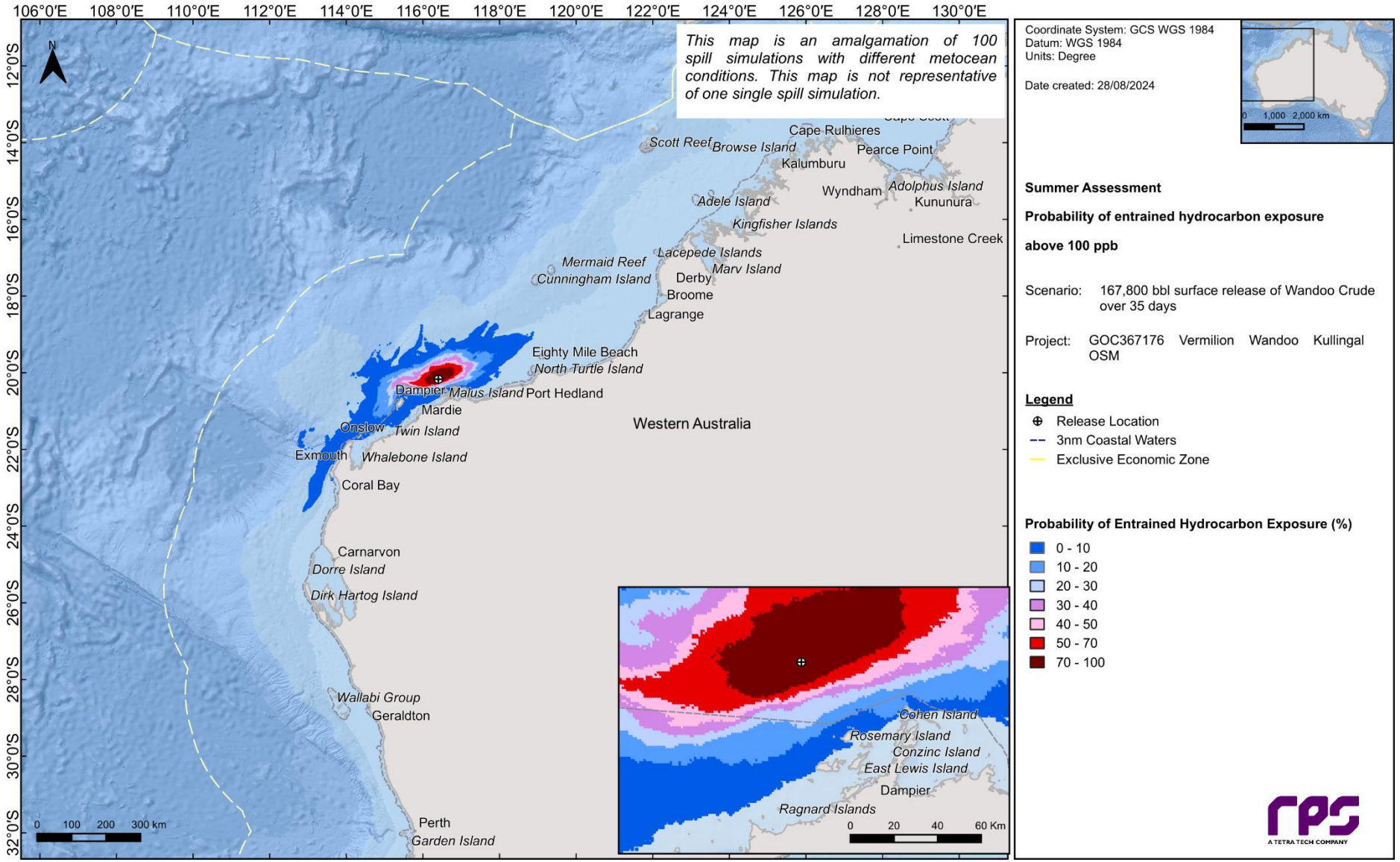

Figure 13.68 Probability of entrained hydrocarbon exposure at, or above, 100 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

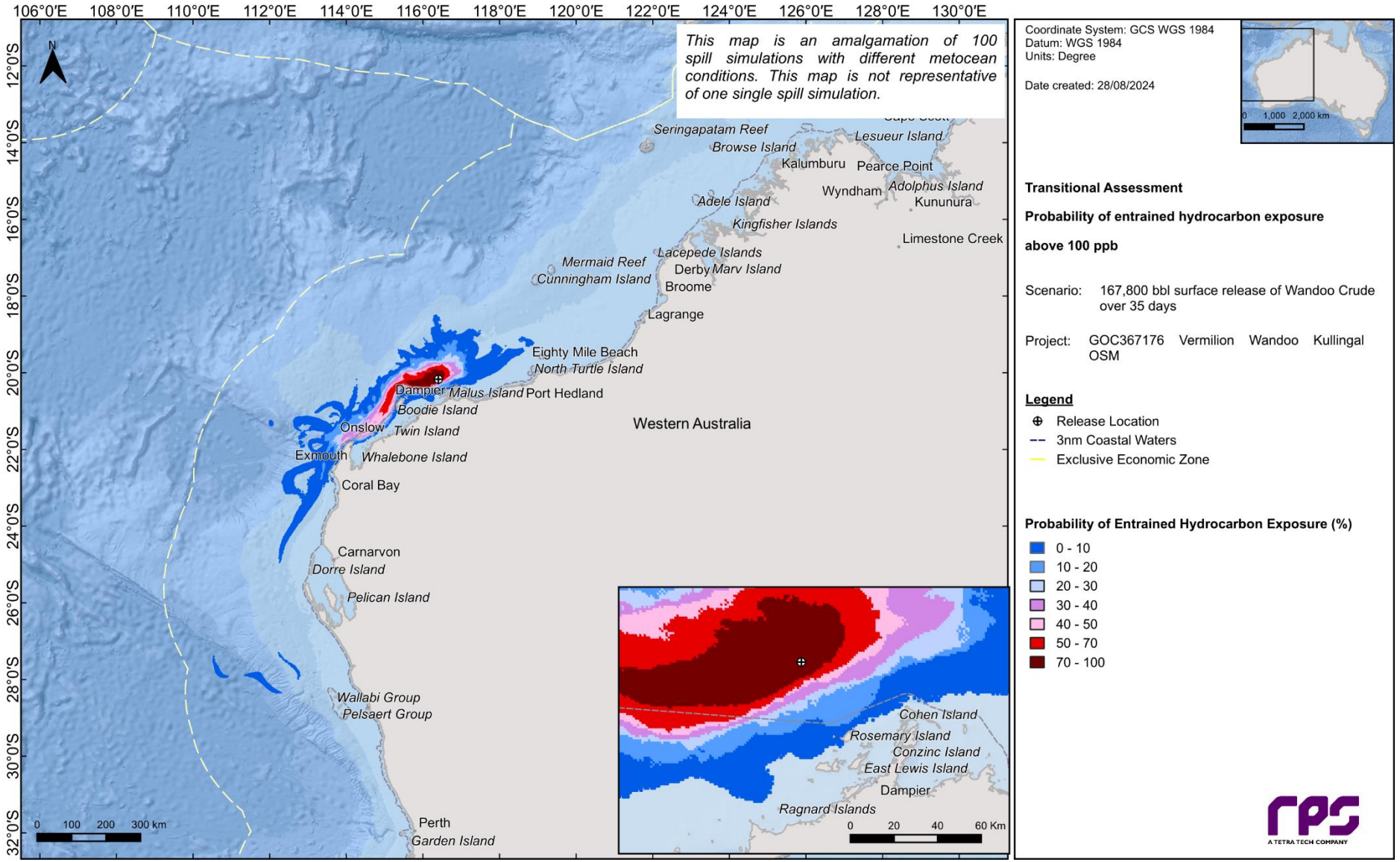

Figure 13.69 Probability of entrained hydrocarbon exposure at, or above, 100 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

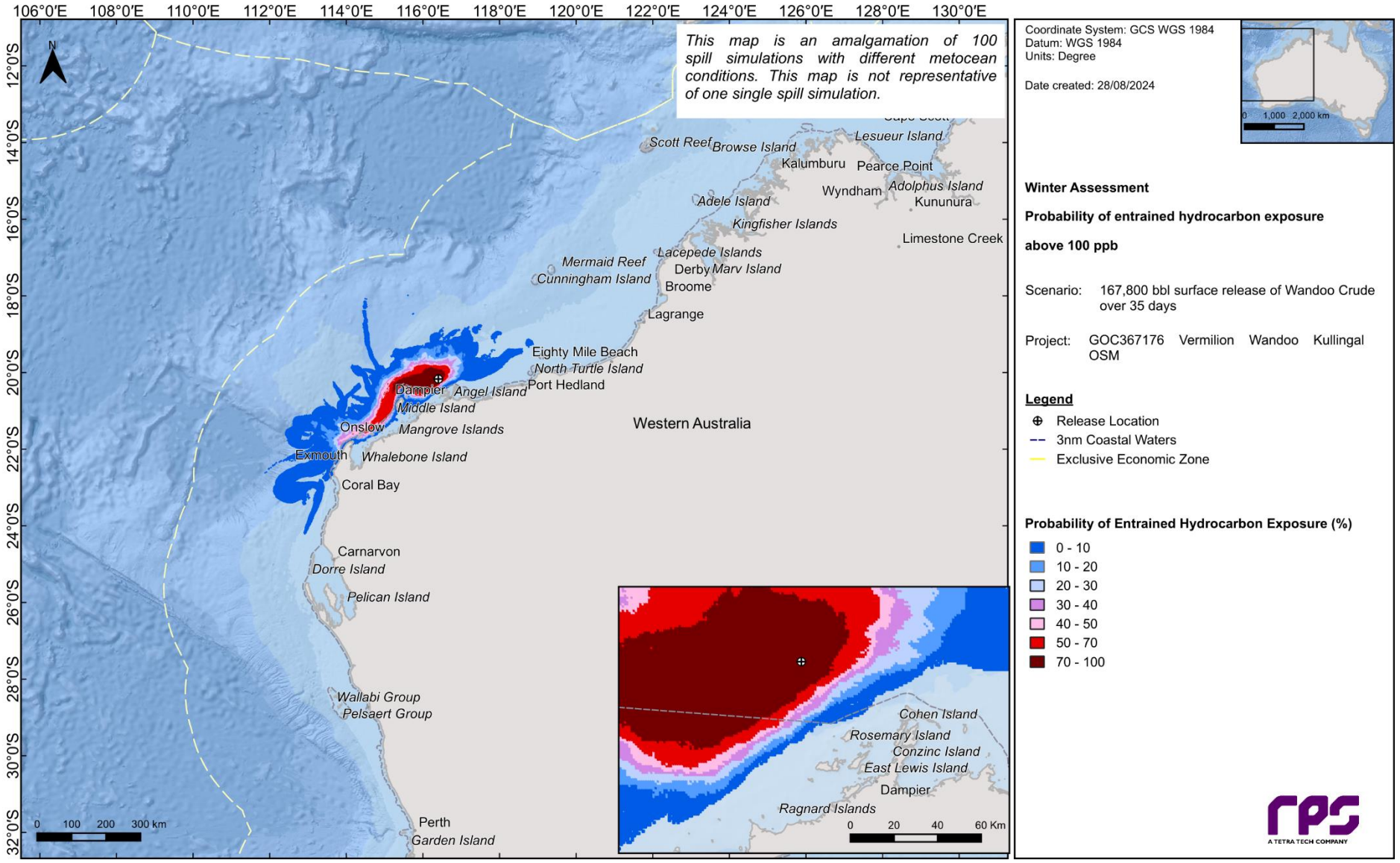

Figure 13.70 Probability of entrained hydrocarbon exposure at, or above, 100 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

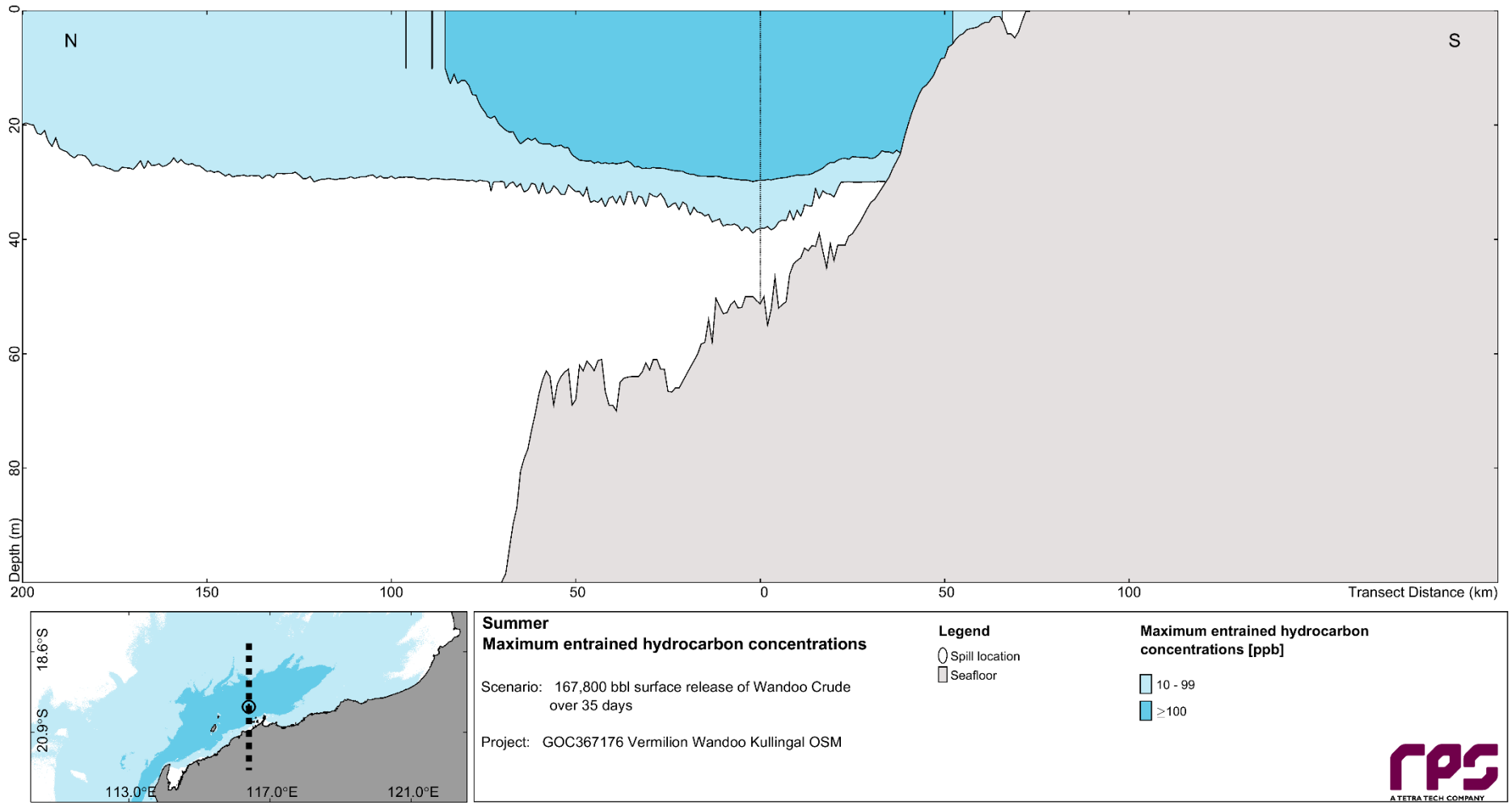

Figure 13.71 North-south cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

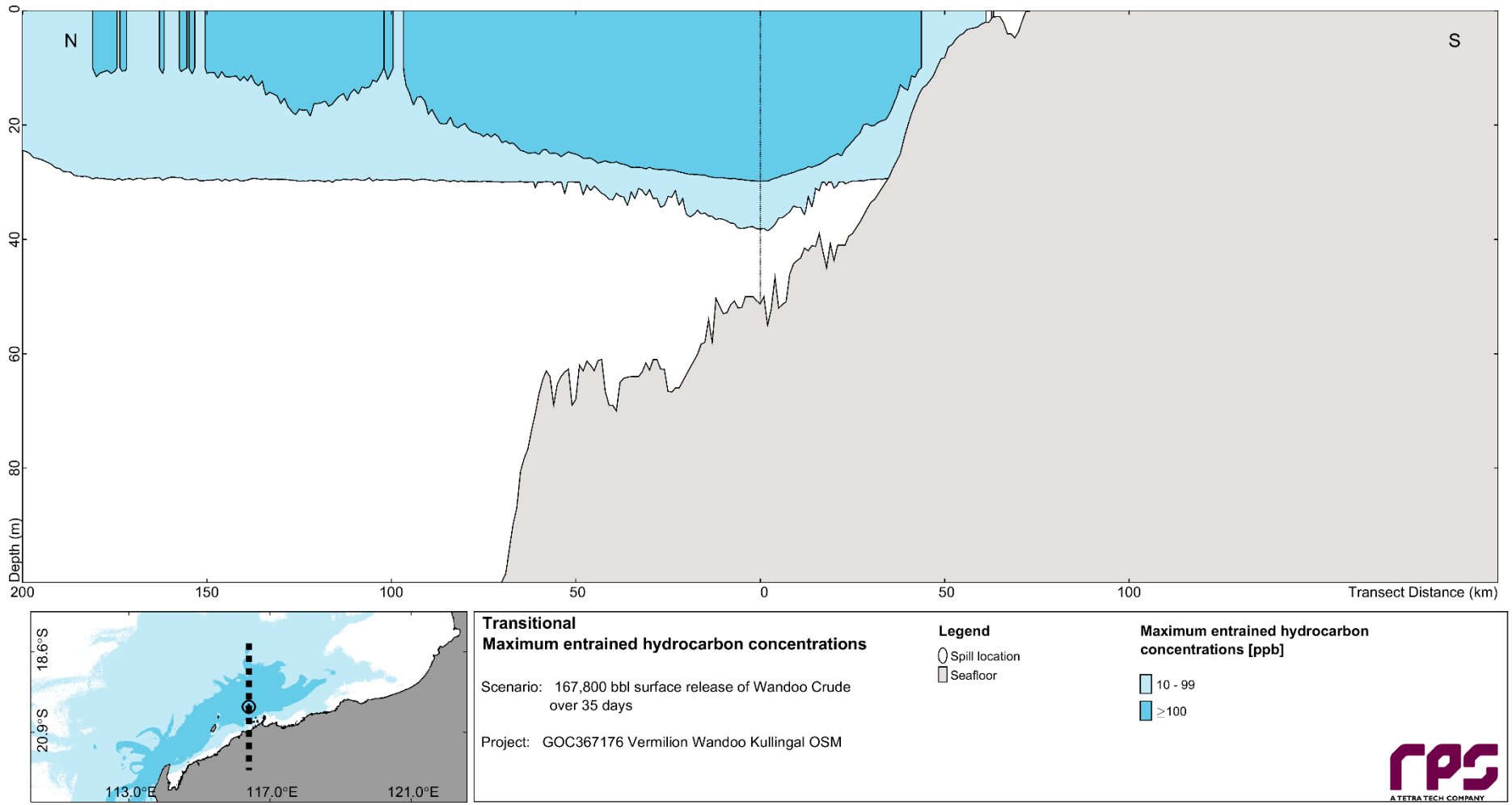

Figure 13.72 North-south cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

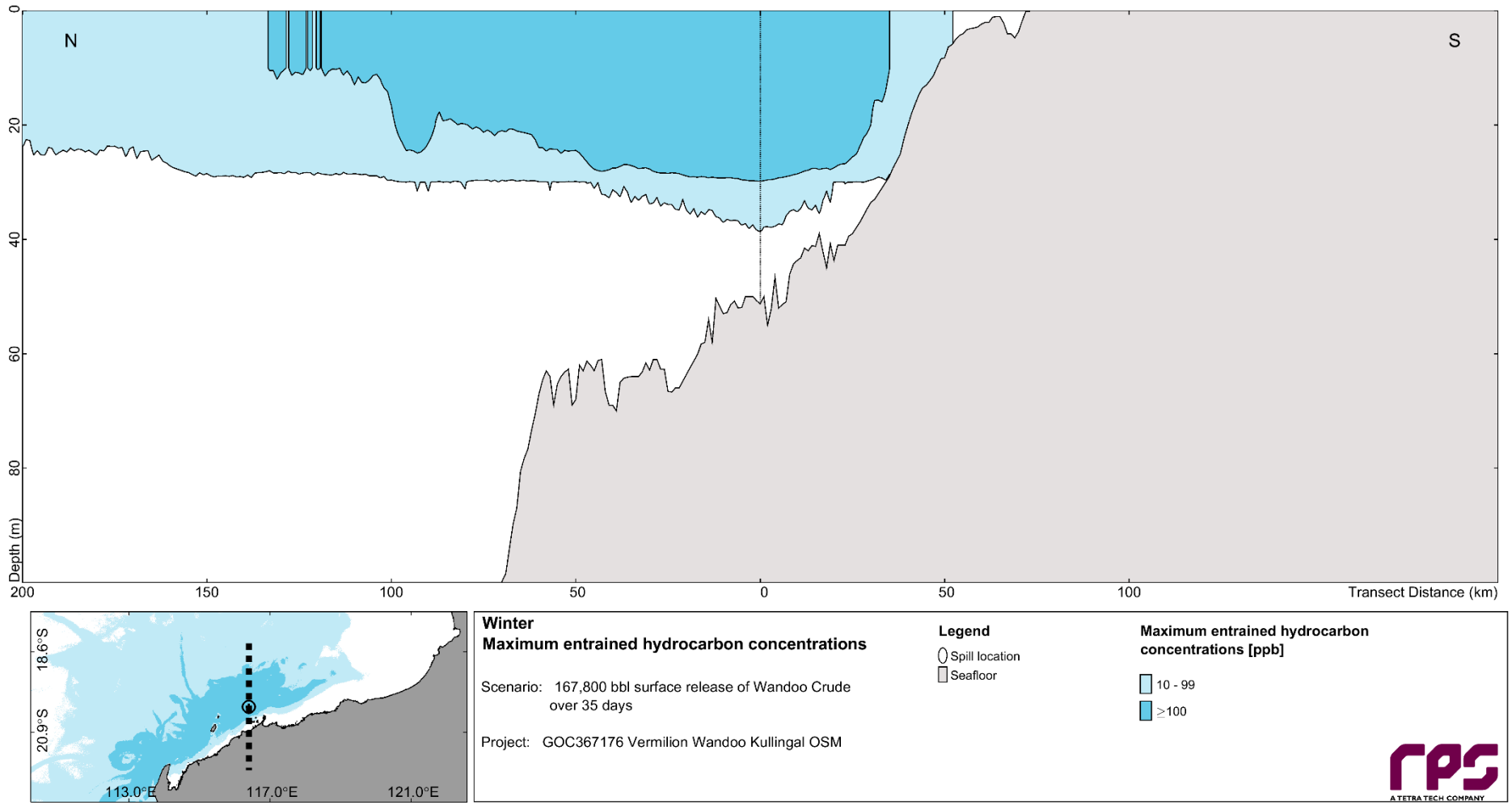

Figure 13.73 North-south cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

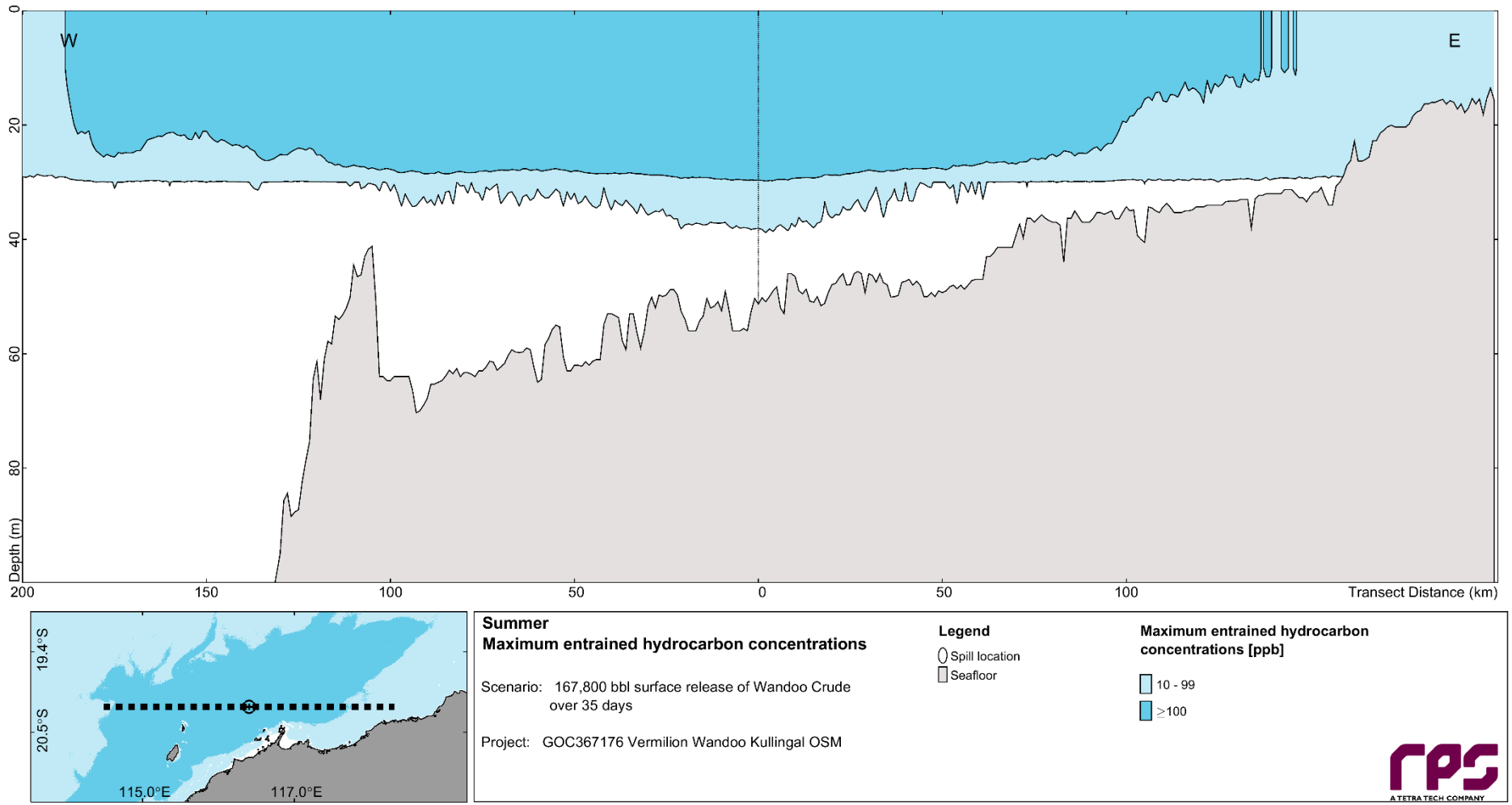

Figure 13.74 East-west cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

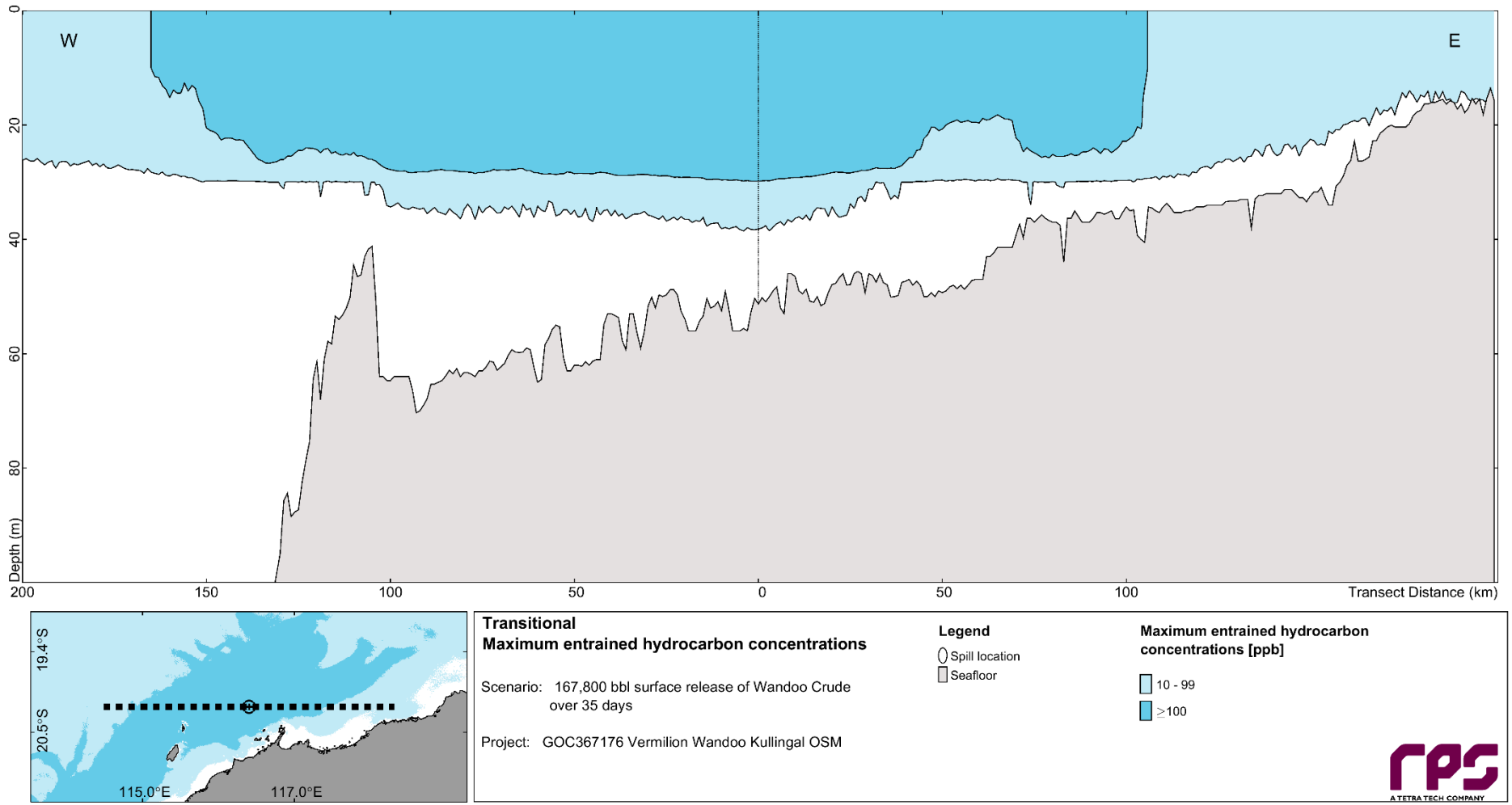

Figure 13.75 East-west cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

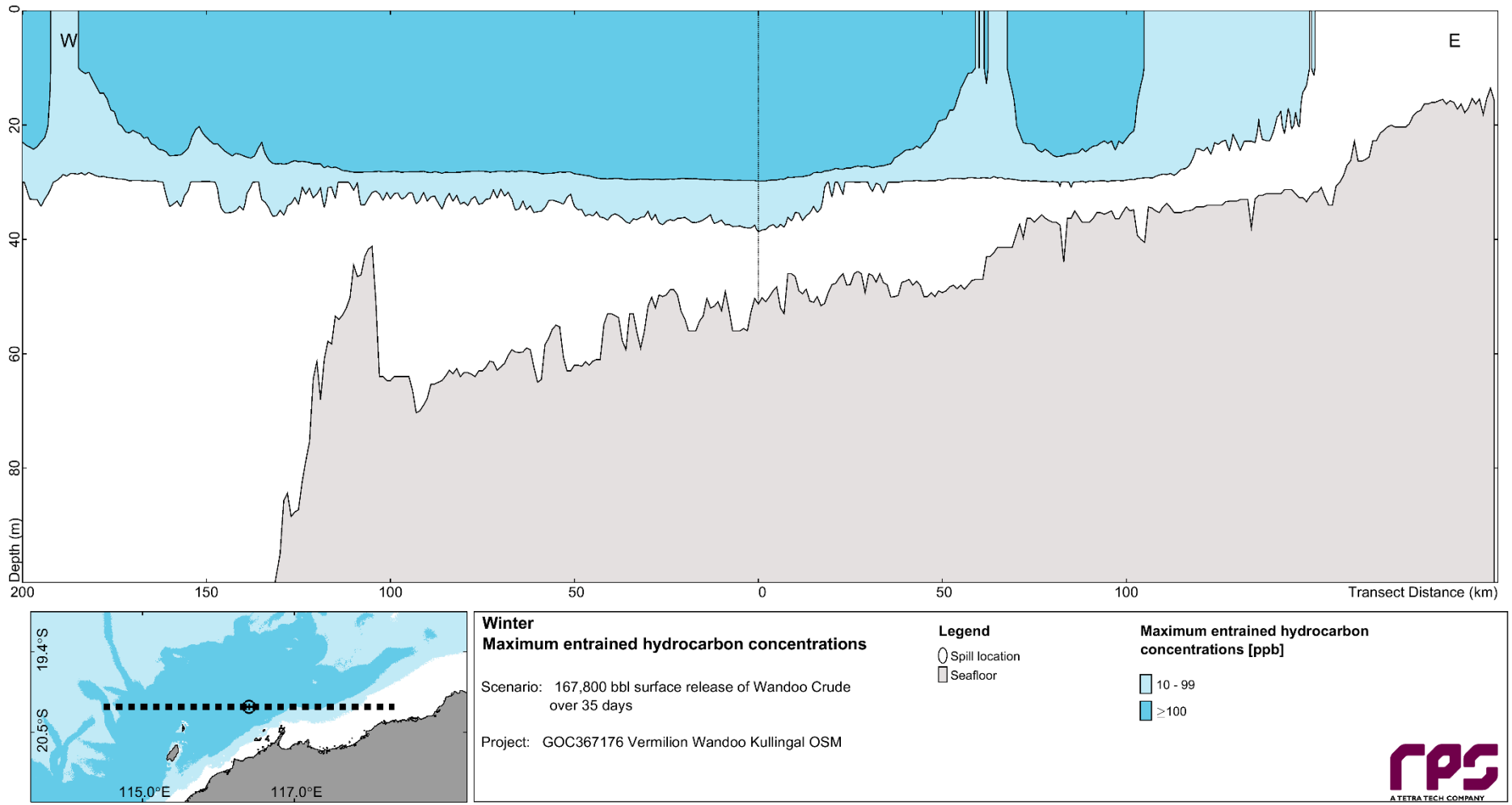

Figure 13.76 East-west cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

13.2 Deterministic Analysis

13.2.1 Greatest Number of Receptors with Floating Oil Exposure Within 7 days

A spill simulation commencing during transitional conditions (run 31) resulted in the greatest number of receptors with floating oil exposure at or above 1 g/m^2 within 7 days.

Figure 13.77 shows the outer boundaries of the low threshold exposure area (EMBA) for the simulation. Figure 13.78 show the floating oil exposure on the surface and shoreline accumulation. Figure 13.79 and Figure 13.80 show the extent of the entrained and dissolved hydrocarbon exposure, respectively, over the entire 56 day simulation.

Table 13.11 provides a summary of the exposure to receptors during the simulation.

The greatest volume of oil accumulation was 2,570 m^3 for WA11.West (318) - Barrow Island and Montebello Islands (A), which also revealed the maximum length of oil accumulation on shorelines at the 10 g/m^2 or above threshold (64 km). The minimum time before floating oil exposure was predicted to be 57 hours for the Montebello AMP.

Figure 13.81 depicts the weathering and fates graph for the corresponding simulation. At the end of the 56-day simulation, approximately 29.2% (49,000.5 bbl) of the crude is predicted to have decayed, whilst 22.6% (37,846.1 bbl) will have evaporated and 14.9% (25,011.2 bbl) is predicted to entrain. Approximately 13.8% (23,085.0 bbl) of the total volume of oil is predicted to remain on shorelines at the end of the simulation and 7.4% (12,379.9 bbl) will float on the sea surface.

Table 13.11 Receptors predicted to be exposed by floating oil, shoreline accumulation and in-water hydrocarbons following a surface LOWC at Kullingal for the deterministic simulation (transitional, run 31) which greatest number of receptors with floating oil exposure at or above 1 g/m² within 7 days.

Receptors		Floating oil minimum time to receptor (hours) at			Shoreline accumulation minimum time to receptor (hours) at			Maximum local accumulated concentration (g/m²)	Maximum local accumulated volume (m²)			Maximum length of shoreline (km) at			Entrained minimum time to receptor waters (hours) at		Maximum entrained hydrocarbon concentration (ppb)	Dissolved minimum time to receptor waters (hours) at			Maximum dissolved aromatic hydrocarbon concentration (ppb)
		≥ 1 g/m²	≥ 10 g/m²	≥ 50 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²		≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 ppb	≥ 100 ppb		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	
AMP	Gascoyne	703	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	451	NC	92	991	NC	NC	13
	Montebello	57	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	28	32	1,412	34	61	NC	94
KEF	Ancient coastline at 125 m depth contour	387	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	321	357	321	1,133	NC	NC	18
	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	532	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	383	401	220	1,182	NC	NC	15
	Commonwealth waters adjacent to Ningaloo Reef	543	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	406	450	186	967	NC	NC	12
	Continental Slope Demersal Fish Communities	598	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	339	682	124	981	NC	NC	13
	Exmouth Plateau	751	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	658	NC	92	NC	NC	NC	5
	Western demersal slope and associated fish communities	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,101	NC	11	NC	NC	NC	<1
MMA	Muiron Islands	510	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	382	504	292	730	NC	NC	16
MP	Barrow Island	144	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	114	123	415	140	NC	NC	32
	Montebello Islands	141	779	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	65	72	2,062	82	118	NC	66
	Ningaloo	497	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	406	450	197	756	NC	NC	20
NR	Barrow Island	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	639	NC	63	NC	NC	NC	<1
	Lowendal Islands	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	326	451	294	NC	NC	NC	7
	Thevenard Island	623	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	635	NC	29	NC	NC	NC	3
RSB	Beryl Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	759	NC	30	NC	NC	NC	<1
	Brewis Reef	635	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	589	NC	32	NC	NC	NC	2
	Camplin Shoal	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,321	NC	11	NC	NC	NC	<1
	Combe Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	711	NC	69	NC	NC	NC	<1
	Dailey Shoal	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	475	689	182	NC	NC	NC	4
	Exmouth Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	737	NC	39	NC	NC	NC	2
	Fairway Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	516	NC	94	NC	NC	NC	<1
	Hood Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	503	685	201	NC	NC	NC	3
	Locker Reef	625	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	8	NC	NC	NC	<1
	Montebello Shoals	145	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	83	115	581	124	NC	NC	32
	Ningaloo Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	443	478	161	NC	NC	NC	9
	North West Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	502	NC	92	NC	NC	NC	4
	Otway Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	490	710	168	NC	NC	NC	<1
	Outtrim Patches	683	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	384	826	206	NC	NC	NC	3
	Pearl Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	760	NC	21	NC	NC	NC	<1
	Penguin Bank	536	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	142	587	261	NC	NC	NC	7
	Poivre Reef	524	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	166	524	244	598	NC	NC	18

	Rosily Shoals	603	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	289	610	149	NC	NC	NC	5
	Santo Rock	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,223	NC	13	NC	NC	NC	<1
	Spider Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	698	NC	16	NC	NC	NC	<1
	Sultan Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	624	NC	24	NC	NC	NC	2
	Taunton Reef	614	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	613	NC	18	NC	NC	NC	<1
	Trap Reef	614	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	574	NC	61	NC	NC	NC	2
	Tryal Rocks	393	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	195	405	217	475	NC	NC	15
	Web Reef	NC	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	784	NC	17	NC	NC	NC	<1
	WA09 (169) - Cape Inscription - Herald Bay N (B)	NC	NC	NC	1,300	NC	NC	12	<1	NC	NC	1	NC	NC	NC	NC	3	NC	NC	NC	<1
	WA09 (171) - Steep Point - Quoin Head (C)	NC	NC	NC	1,332	NC	NC	12	<1	NC	NC	1	NC	NC	NC	NC	2	NC	NC	NC	<1
	WA09 (330) - Dorre Island and Bernier Island (A)	NC	NC	NC	1,300	NC	NC	13	<1	NC	NC	1	NC	NC	NC	NC	4	NC	NC	NC	<1
	WA09 (331) - Dorre Island and Bernier Island (B)	NC	NC	NC	1,313	NC	NC	12	<1	NC	NC	1	NC	NC	NC	NC	2	NC	NC	NC	<1
	WA10 (120) - Bundegi - Shothole Canyon N (A)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1,247	NC	23	NC	NC	NC	<1
	WA10 (121) - Bundegi - Shothole Canyon N (B)	NC	NC	NC	521	1,003	NC	194	3	2	NC	3	1	NC	650	NC	67	NC	NC	NC	4
	WA10 (122) - Vlamingh Head - North West Cape	619	NC	NC	470	739	NC	770	42	42	NC	9	9	NC	413	1,179	157	778	NC	NC	15
SHORE-WAMOPRA	WA10 (123) - Low Point - Vlamingh Head (A)	615	NC	NC	499	1,260	NC	607	23	19	NC	13	6	NC	417	464	197	857	NC	NC	12
	WA10 (124) - Low Point - Vlamingh Head (B)	497	NC	NC	499	507	NC	470	28	24	NC	16	9	NC	453	478	192	NC	NC	NC	9
	WA10 (125) - Osprey Bay - Low Point	NC	NC	NC	600	1,039	NC	111	7	3	NC	13	2	NC	482	1,088	113	NC	NC	NC	4
	WA10 (126) - Winderabandi Point - Osprey Bay	NC	NC	NC	876	1,299	NC	120	5	3	NC	12	2	NC	823	NC	33	NC	NC	NC	5
	WA10 (127) - Coast Hill - Point Cloates	NC	NC	NC	1,214	NC	NC	36	2	NC	NC	7	NC	NC	868	NC	23	NC	NC	NC	3
	WA10 (128) - Point Maud - Coast Hill (A)	NC	NC	NC	1,237	1,335	NC	121	5	2	NC	11	1	NC	1,058	NC	27	NC	NC	NC	<1
	WA10 (129) - Point Maud - Coast Hill (B)	NC	NC	NC	1,264	1,335	NC	109	4	2	NC	10	1	NC	1,065	NC	24	NC	NC	NC	<1
	WA10 (130) - Alison Point - Point Maud	NC	NC	NC	1,297	NC	NC	25	2	NC	NC	8	NC	NC	NC	NC	7	NC	NC	NC	<1
	WA10 (131) - Gnarraloo Bay - Alison Point (A)	NC	NC	NC	1,294	NC	NC	25	<1	NC	NC	2	NC	NC	NC	NC	6	NC	NC	NC	<1
	WA10 (132) - Gnarraloo Bay - Alison Point (B)	NC	NC	NC	1,288	NC	NC	25	<1	NC	NC	5	NC	NC	NC	NC	5	NC	NC	NC	<1
	WA10 (133) - Red Bluff - Gnarraloo Bay (A)	NC	NC	NC	1,293	NC	NC	35	2	NC	NC	7	NC	NC	NC	NC	5	NC	NC	NC	<1

WA10 (134) - Red Bluff - Gnarraloo Bay (B)	NC	NC	NC	1,292	NC	NC	35	<1	NC	NC	4	NC	NC	NC	NC	5	NC	NC	NC	<1
WA10 (135) - Red Bluff - Gnarraloo Bay (C)	NC	NC	NC	1,278	NC	NC	24	2	NC	NC	9	NC	NC	NC	NC	5	NC	NC	NC	<1
WA10 (136) - Point Quobba - Cape Cuvier (A)	NC	NC	NC	1,293	NC	NC	13	<1	NC	NC	4	NC	NC	NC	NC	5	NC	NC	NC	<1
WA11.West (113) - Coolgra Point W - Yardie Landing (A)	NC	NC	NC	1,344	NC	NC	16	<1	NC	NC	1	NC	NC	NC	NC	2	NC	NC	NC	<1
WA11.West (114) - Coolgra Point W - Yardie Landing (B)	NC	NC	NC	1,295	NC	NC	30	<1	NC	NC	1	NC	NC	NC	NC	3	NC	NC	NC	<1
WA11.West (115) - Hope Point - Locker Point (A)	NC	NC	NC	601	1,299	NC	177	6	4	NC	11	2	NC	NC	NC	10	NC	NC	NC	<1
WA11.West (116) - Hope Point - Locker Point (B)	NC	NC	NC	1,303	NC	NC	29	<1	NC	NC	4	NC	NC	NC	NC	5	NC	NC	NC	<1
WA11.West (117) - Hope Point - Locker Point (C)	NC	NC	NC	1,272	1,340	NC	151	5	2	NC	12	1	NC	NC	NC	6	NC	NC	NC	<1
WA11.West (118) - Hope Point - Locker Point (D)	NC	NC	NC	1,333	NC	NC	12	<1	NC	NC	1	NC	NC	NC	NC	<1	NC	NC	NC	<1
WA11.West (318) - Barrow Island and Montebello Islands (A)	143	779	NC	85	129	329	22,688	2,570	2,565	2,493	64	50	29	81	115	2,062	116	118	NC	66
WA11.West (319) - Barrow Island and Montebello Islands (B)	166	NC	NC	141	166	458	5,979	187	187	133	15	14	5	127	134	766	451	NC	NC	49
WA11.West (320) - Barrow Island and Montebello Islands (C)	159	NC	NC	137	530	NC	298	32	23	NC	41	14	NC	131	566	110	NC	NC	NC	6
WA11.West (321) - Barrow Island and Montebello Islands (D)	149	NC	NC	141	174	NC	637	60	53	NC	41	20	NC	130	176	336	529	NC	NC	25
WA11.West (324) - Yardie Landing - Weld Island coast S (B)	516	NC	NC	613	615	NC	672	8	7	NC	3	1	NC	141	527	526	600	NC	NC	18
WA11.West (325) - Coolgra Point W - Yardie Landing (C)	610	NC	NC	603	624	NC	744	37	36	NC	9	7	NC	314	612	289	NC	NC	NC	10
WA11.West (326) - Baresand Point - Entrance Point E	497	637	NC	357	470	598	6,552	282	281	221	24	21	10	345	499	568	653	NC	NC	28
WA11.West (327) - Hope Point - Locker Point (E)	NC	NC	NC	604	630	NC	525	9	9	NC	2	2	NC	477	696	198	NC	NC	NC	3
WA11.West (328) - Hope Point - Locker Point (F)	1,322	NC	NC	624	1,274	NC	723	42	41	NC	13	11	NC	736	NC	34	NC	NC	NC	<1
WA11.West (329) - Locker Point - Baresand Point	510	NC	NC	377	416	545	4,271	404	400	374	30	21	14	375	430	292	726	NC	NC	18

NA: Not applicable for receptor; NC: No contact to receptor predicted for specified threshold.

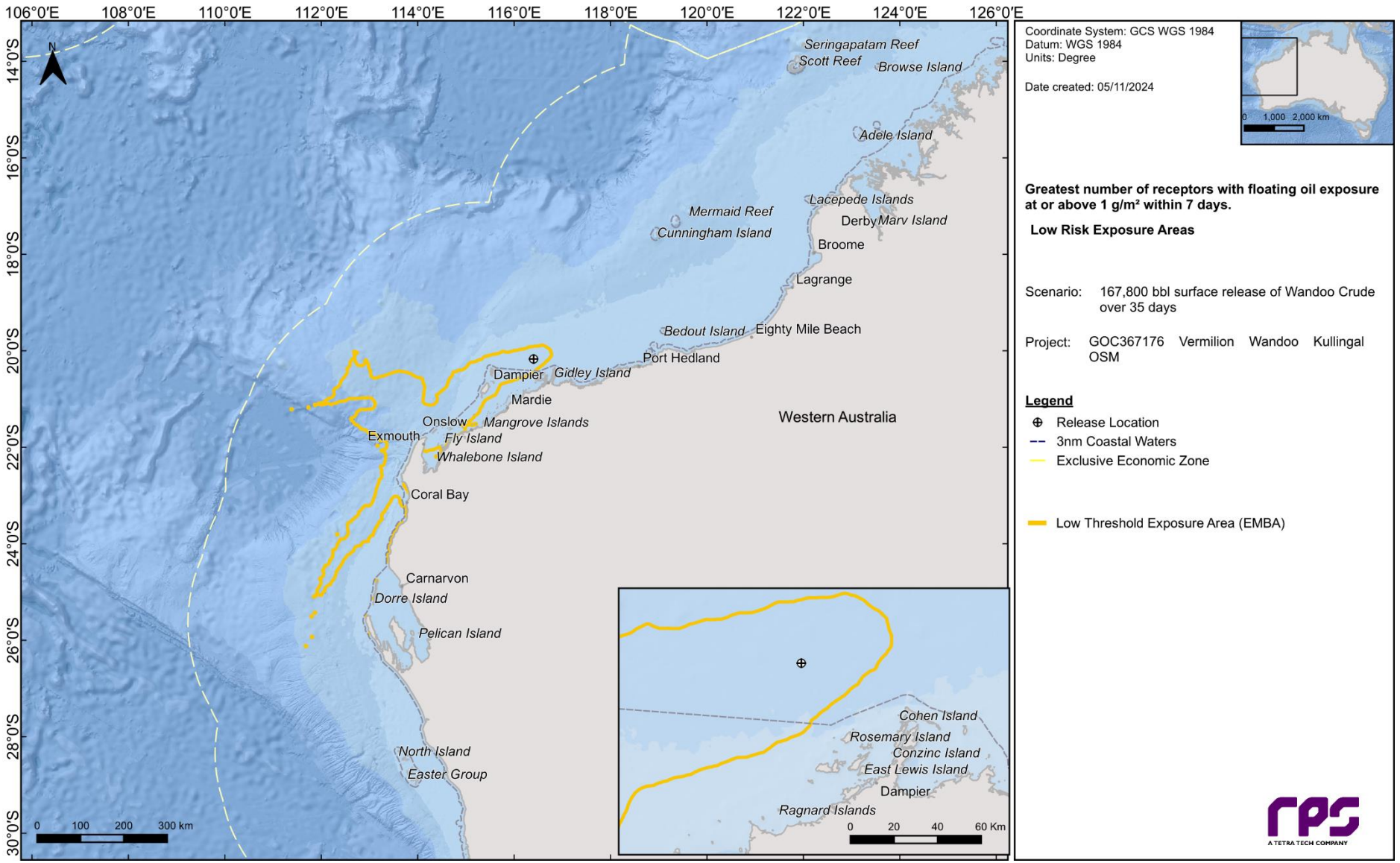

Figure 13.77 Predicted low threshold exposure area following a surface LOWC at Kullingal for the deterministic simulation (transitional, run 31) which resulted in the greatest number of receptors with floating oil exposure at or above 1 g/m² within 7 days.

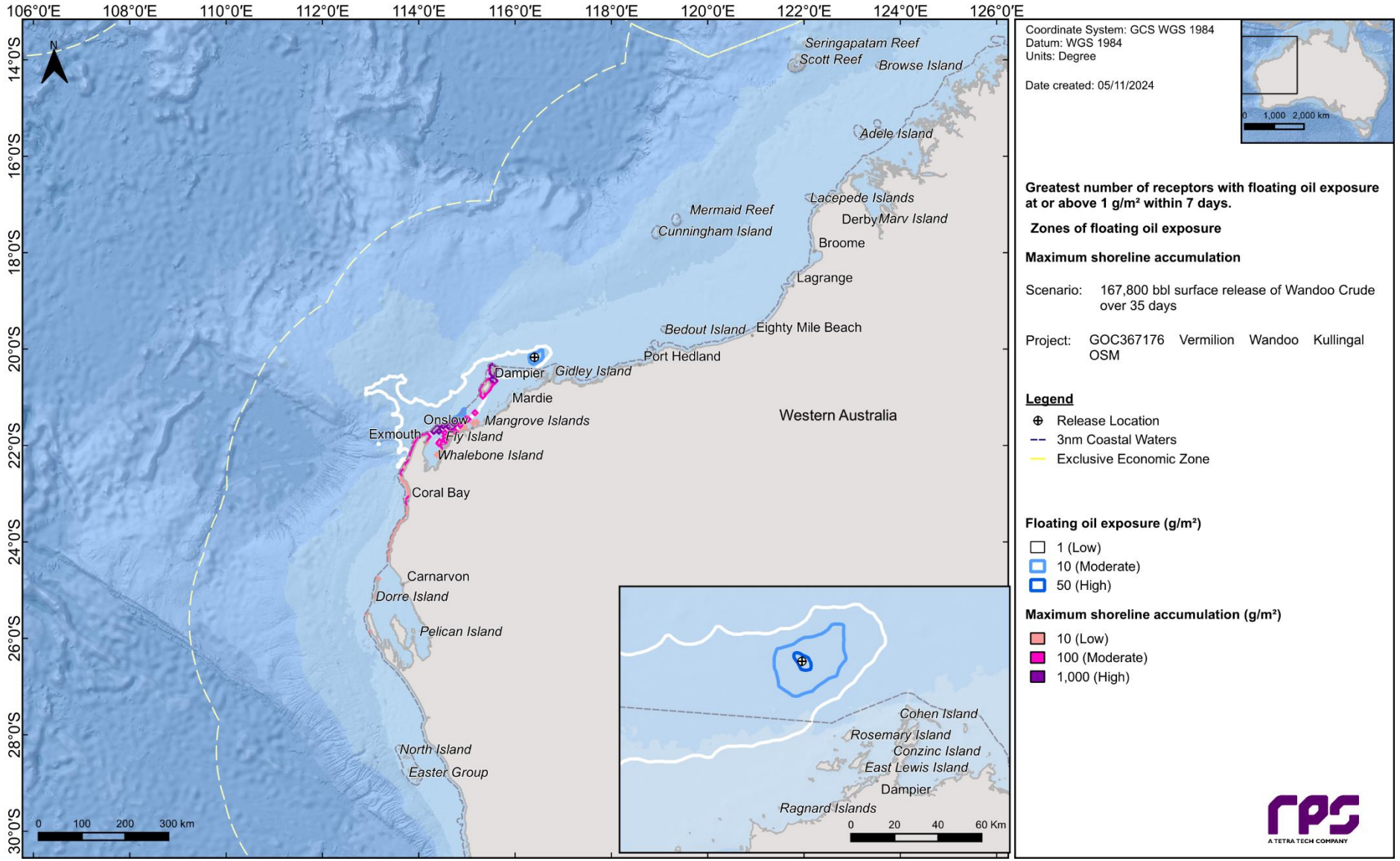

Figure 13.78 Predicted zones of floating oil exposure and maximum shoreline accumulation following a surface LOWC at Kullingal for the deterministic simulation (transitional, run 31) which resulted in the greatest number of receptors with floating oil exposure at or above 1 g/m² within 7 days.

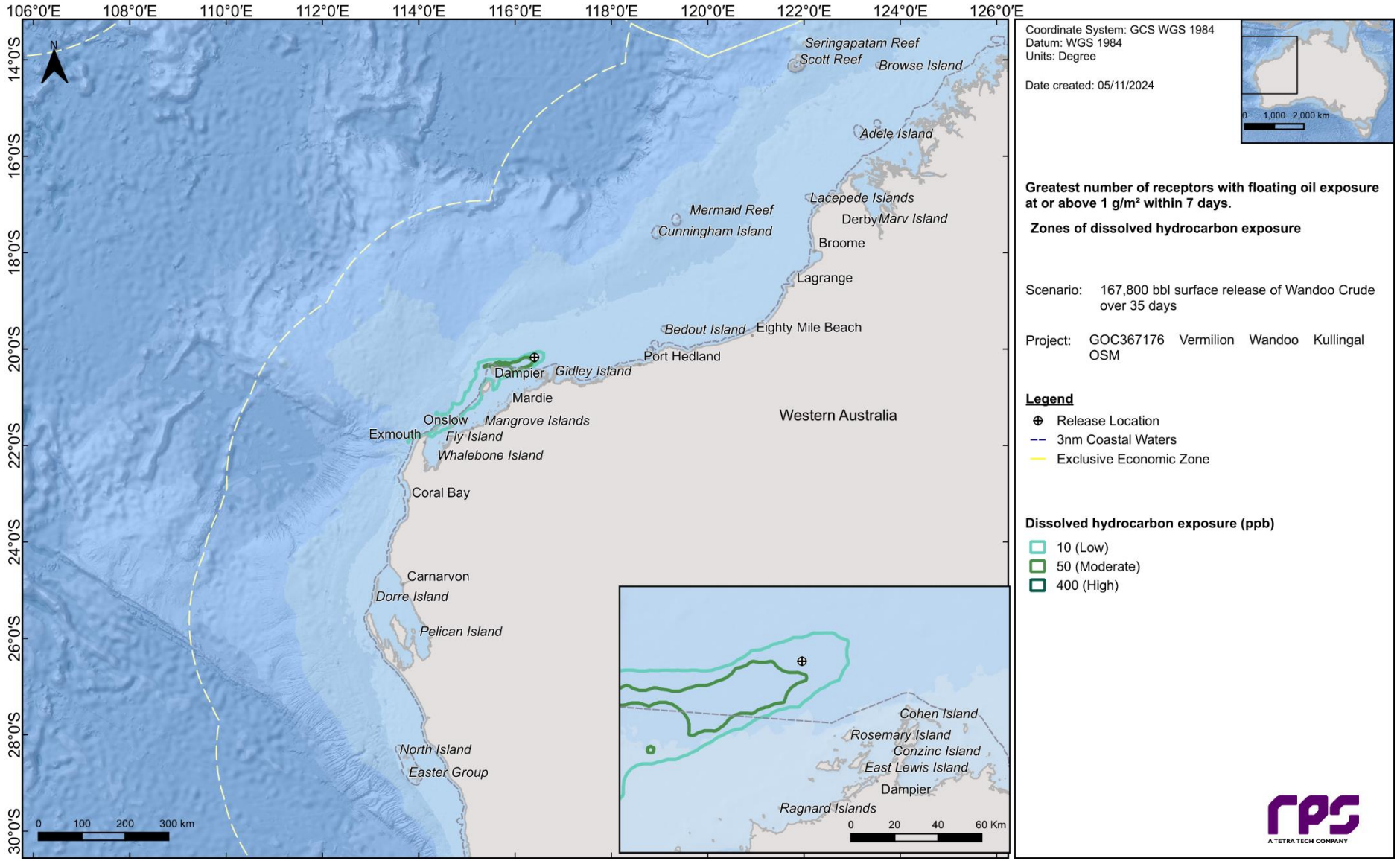

Figure 13.79 Predicted zones of dissolved oil exposure and maximum shoreline accumulation following a surface LOWC at Kullingal for the deterministic simulation (transitional, run 31) which resulted in the greatest number of receptors with floating oil exposure at or above 1 g/m² within 7 days.

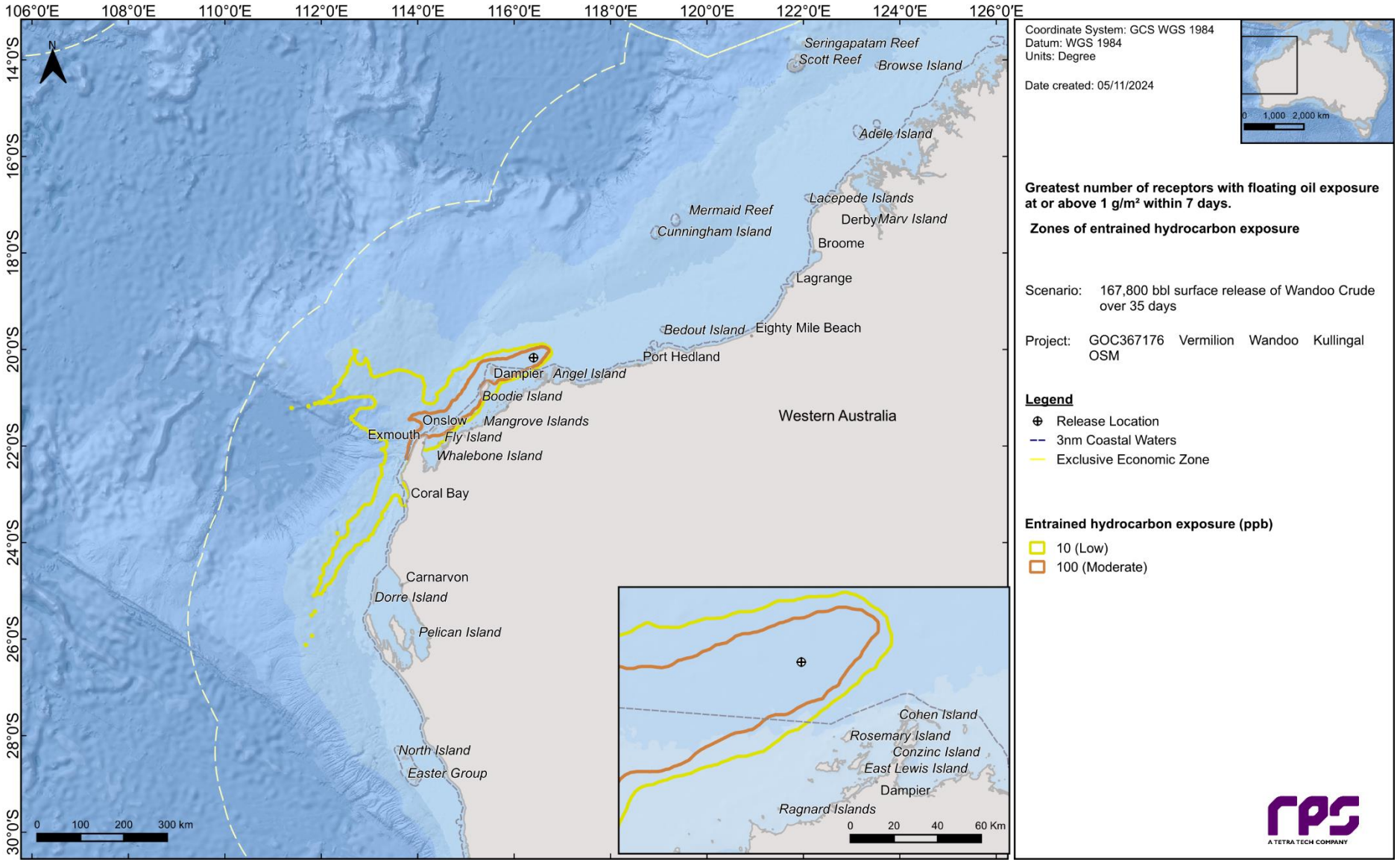

Figure 13.80 Predicted zones of entrained oil exposure and maximum shoreline accumulation following a surface LOWC at Kullingal for the deterministic simulation (transitional, run 31) which resulted in the greatest number of receptors with floating oil exposure at or above 1 g/m² within 7 days.

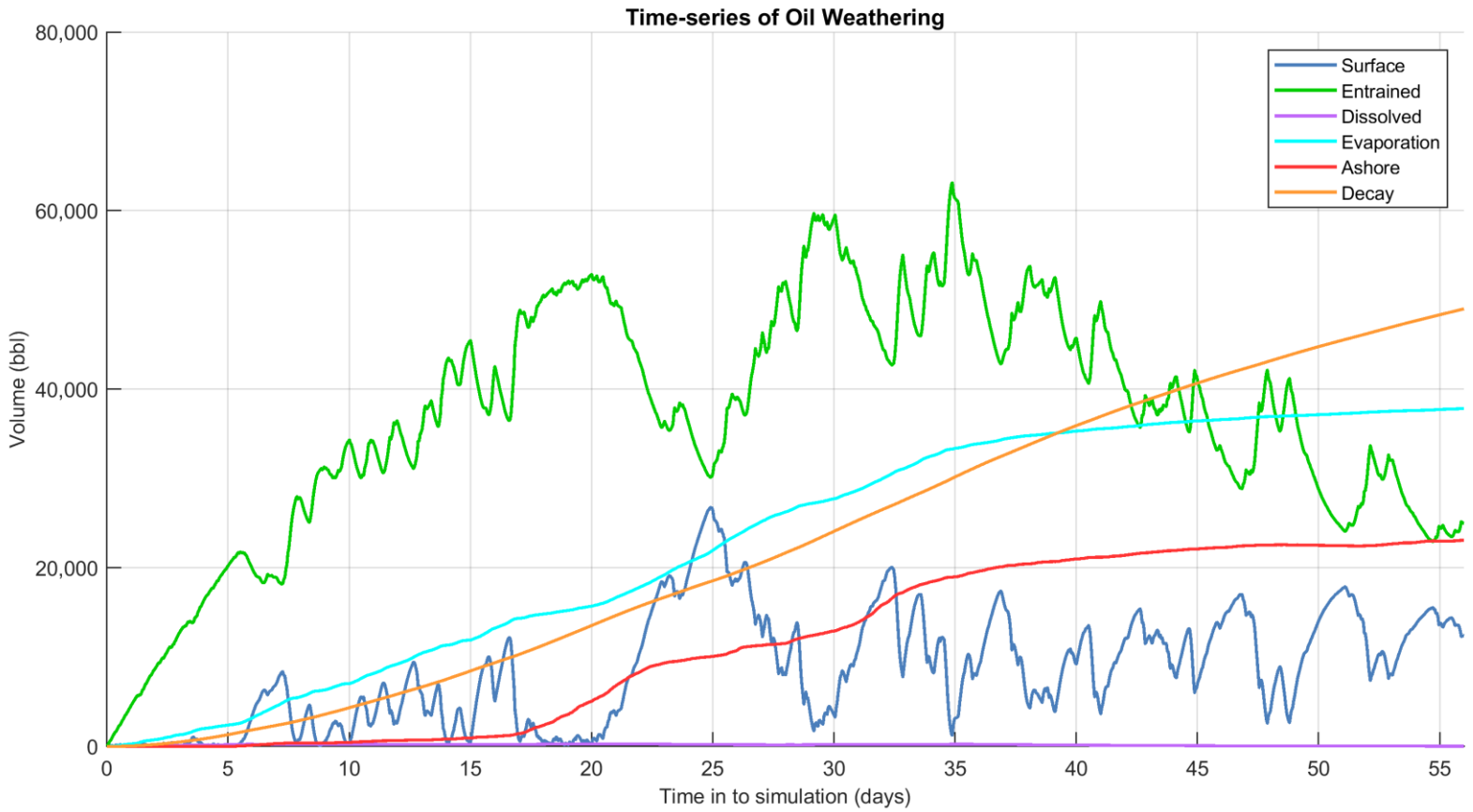

Figure 13.81 Predicted weathering and fates graph following a surface LOWC at Kullingal for the deterministic simulation (transitional, run 31) which resulted in the greatest number of receptors with floating oil exposure at or above 1 g/m^2 within 7 days.

14 MODELLING RESULTS: VESSEL COLLISION

This scenario investigated the potential exposure from a 300 m^3 surface release of MDO over 6 hours resulting from a vessel collision at Kullingal. The MDO was tracked for 30 days from the commencement of the spill to allow the concentrations to decrease below the lowest thresholds. The modelling for this scenario assumed no mitigation efforts are undertaken to collect or otherwise affect the natural transport and weathering.

14.1 Stochastic Analysis

14.1.1 Exposure Areas

Figure 14.1 illustrates the exposure areas for the vessel collision results, determined by integrating the low, moderate, and high threshold results of all 300 spill simulations.

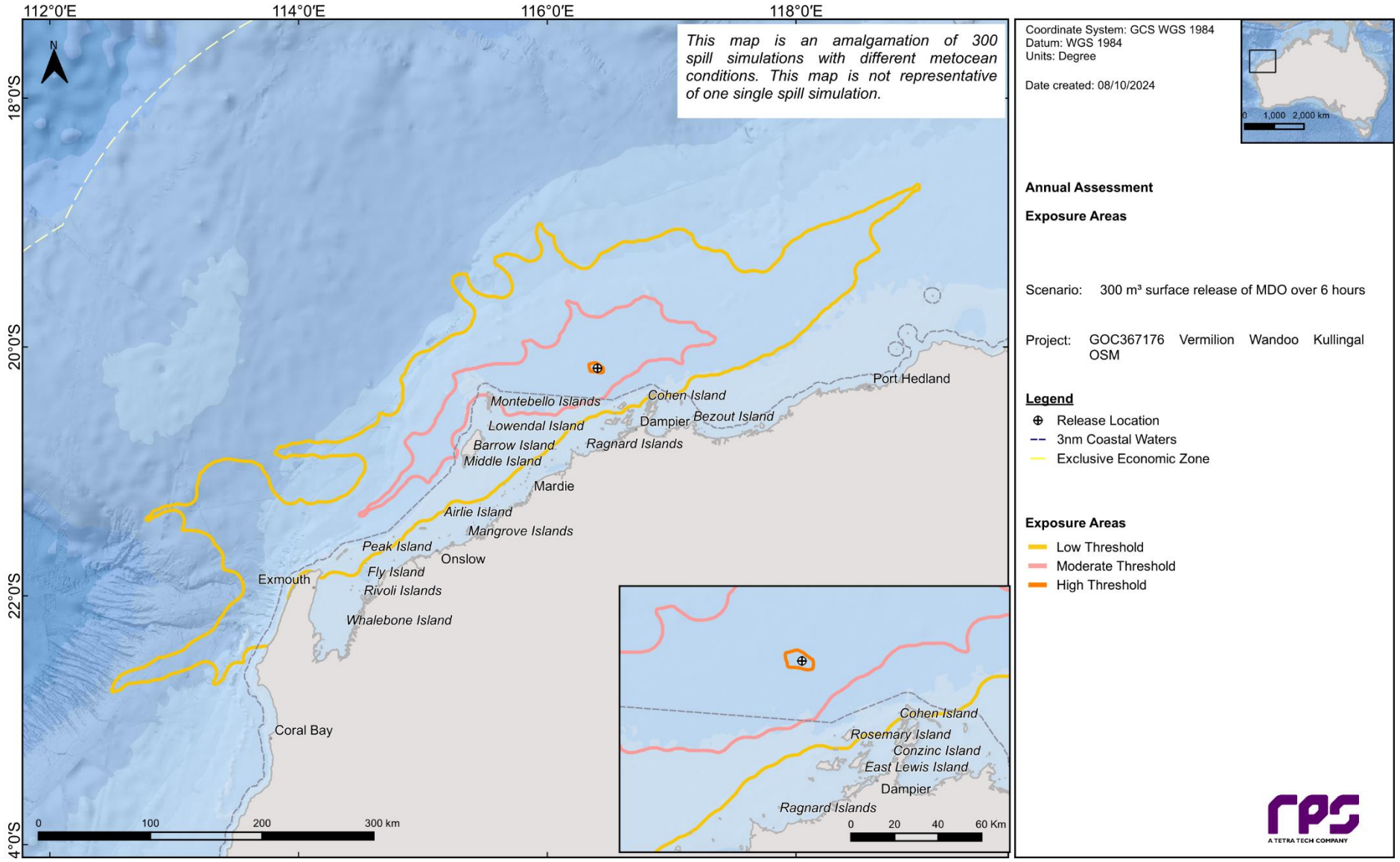

Figure 14.1 Predicted exposure areas following a vessel collision at Kullingal, presented as an annual assessment. The exposure areas were determined by integrating the results of all 300 spill simulations across low, moderate and high thresholds.

14.1.2 Floating Oil Exposure

Table 14.1 summarises the maximum distances from the release location to floating oil exposure thresholds for each season. Concentrations exceeding 1 g/m^2 could extend up to 31 km from the release location. The maximum distances reduced to 18 km and 6 km as the threshold increases to 10 g/m^2 and 50 g/m^2, respectively.

No receptors were predicted to be exposed to floating oil exposure at, or above, 1, g/m^2.

Figure 14.2 to Figure 14.4 illustrate the extent floating oil exposure zones for each season. Figure 14.5 to Figure 14.22 depict the seasonal minimum times before exposure and probability of exposure for assessed thresholds.

Table 14.1 Maximum distances from the release location to floating oil exposure thresholds from a vessel collision at Kullingal. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Floating oil exposure thresholds		
		1 g/m^2	10 g/m^2	50 g/m^2
Summer	Maximum distance (km) from release location	21	14	5
	Direction	Northeast	Northeast	West
Transitional	Maximum distance (km) from release location	31	17	6
	Direction	East	Northwest	Northwest
Winter	Maximum distance (km) from release location	29	18	3
	Direction	South	South	East

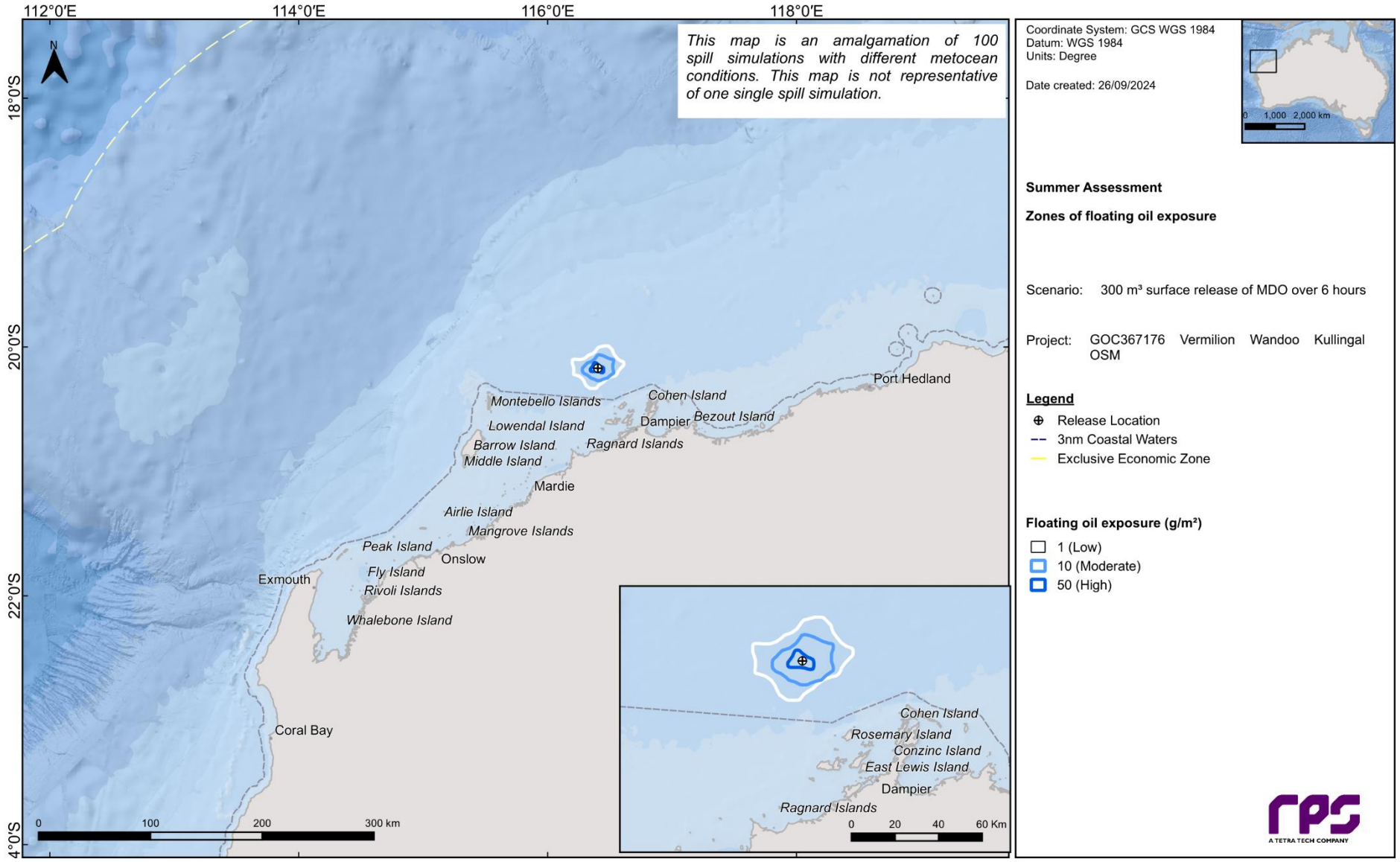

Figure 14.2 Predicted zones of floating oil exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

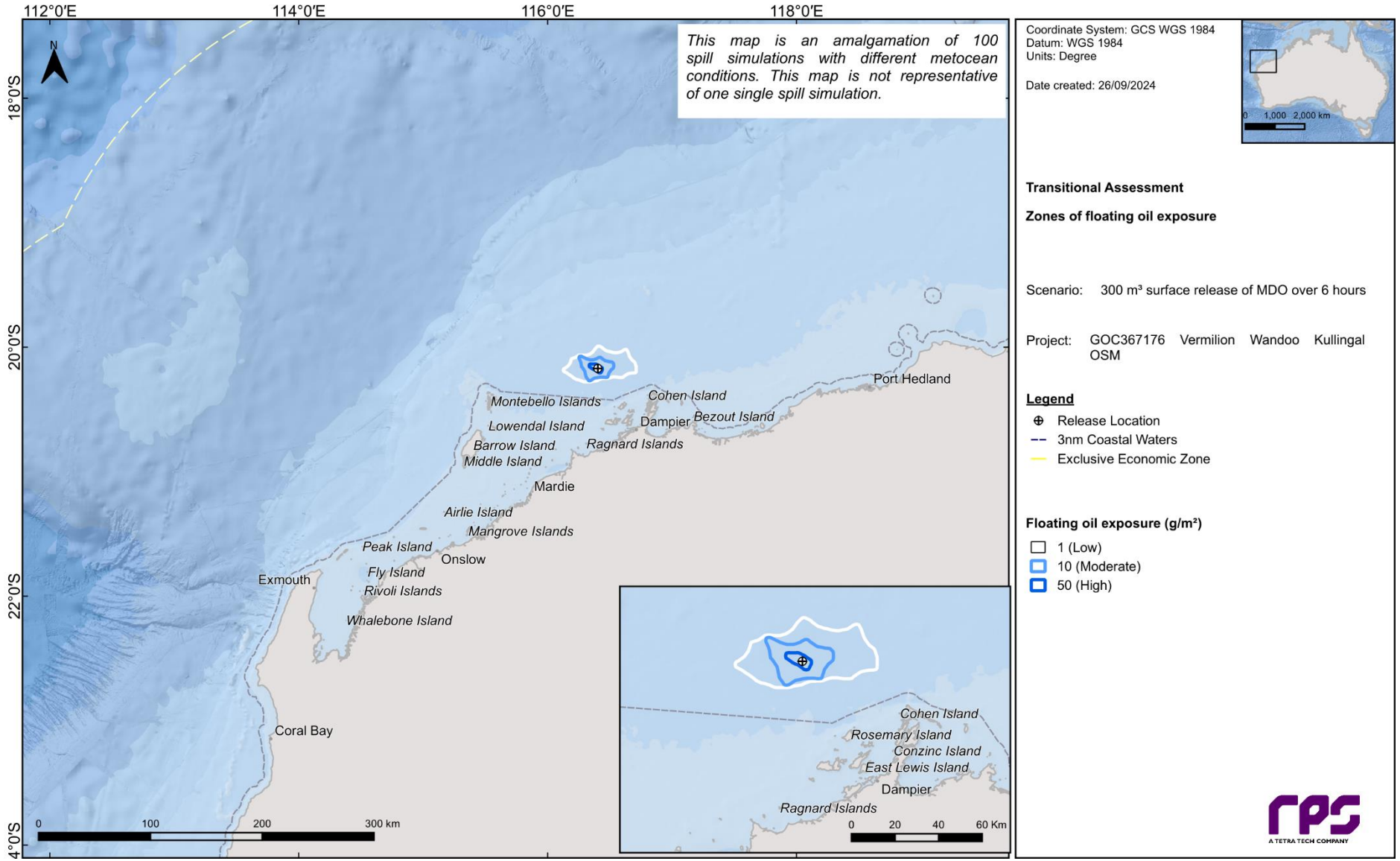

Figure 14.3 Predicted zones of floating oil exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

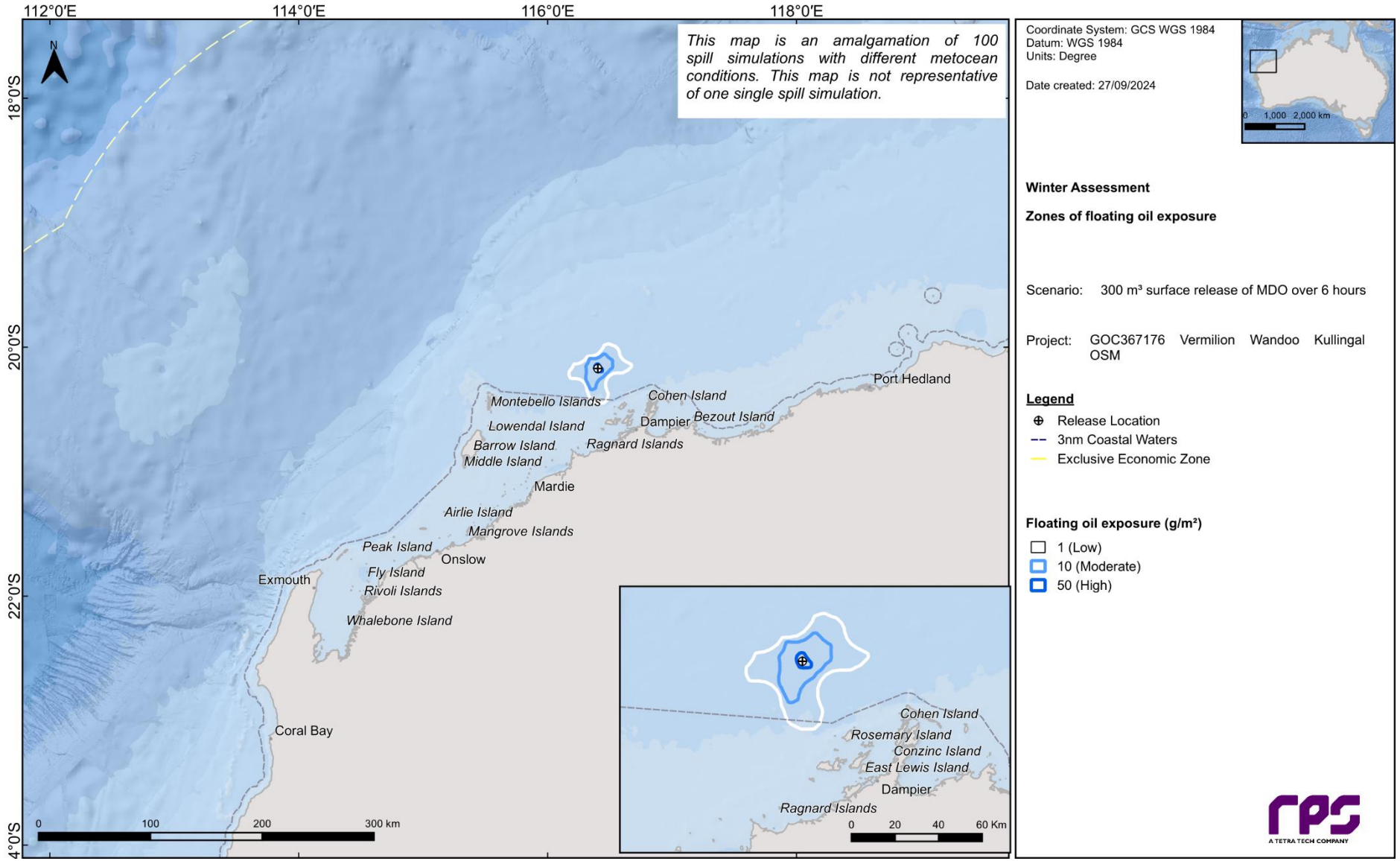

Figure 14.4 Predicted zones of floating oil exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

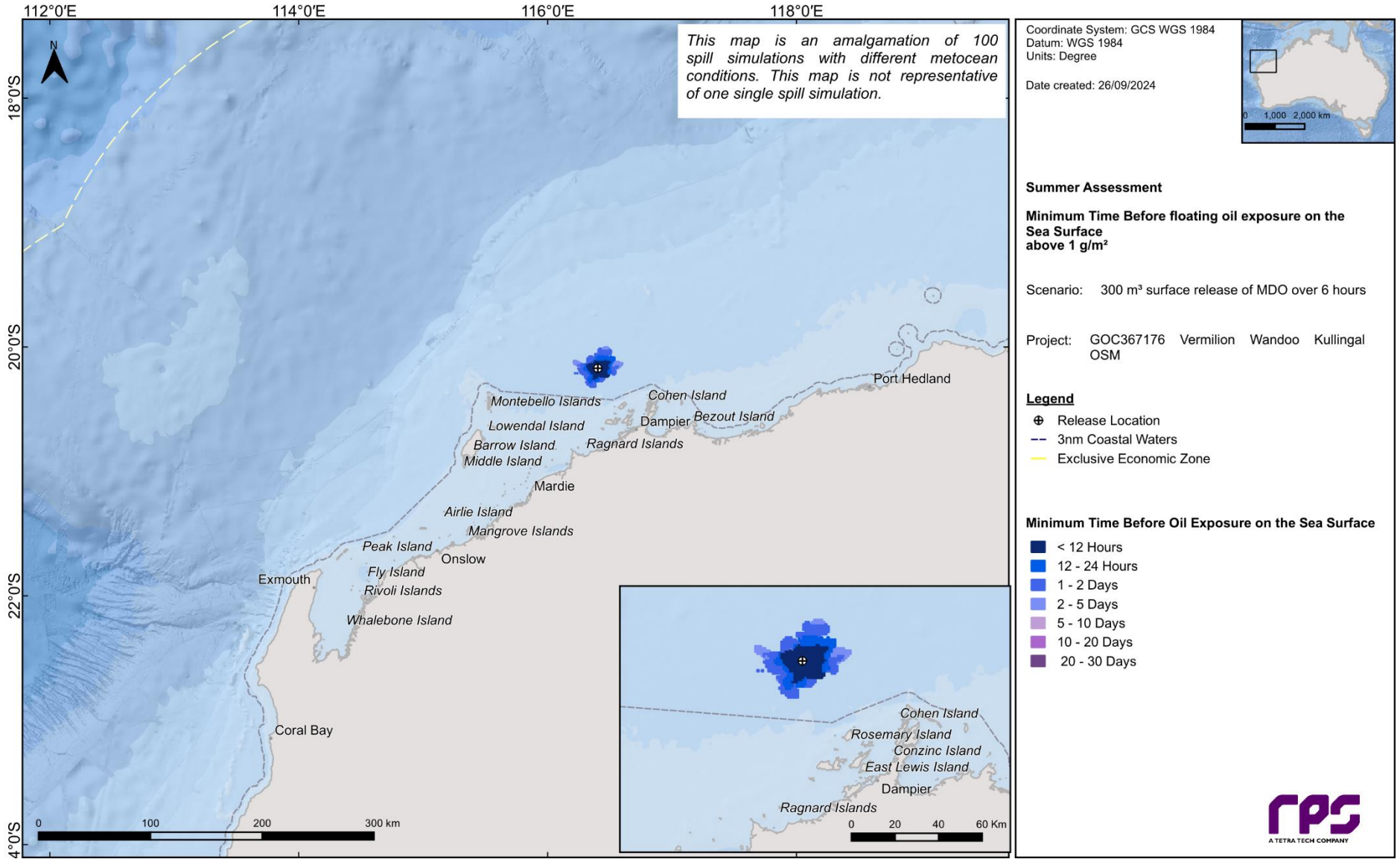

Figure 14.5 Minimum time before floating oil exposure at, or above, 1 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

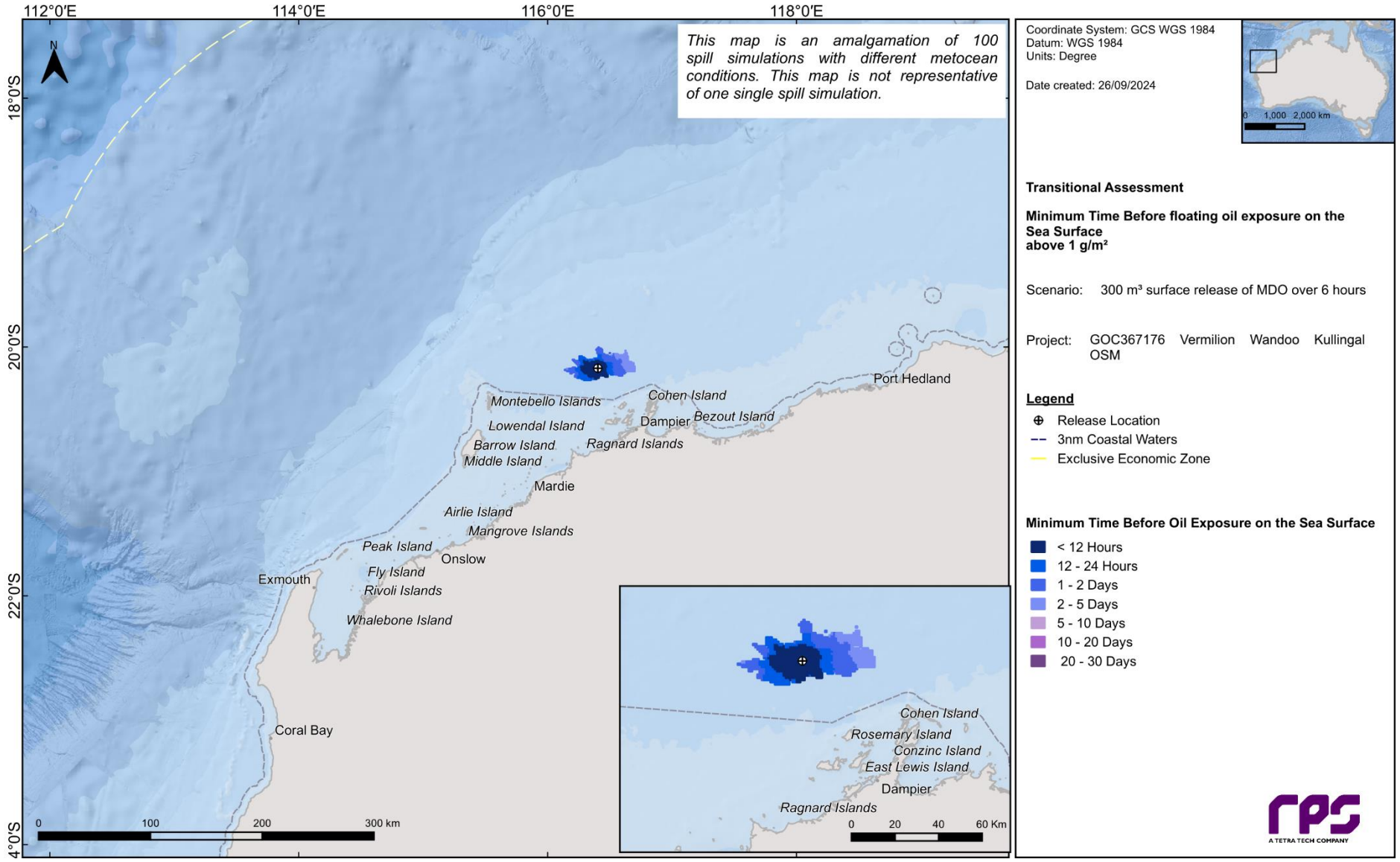

Figure 14.6 Minimum time before floating oil exposure at, or above, 1 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

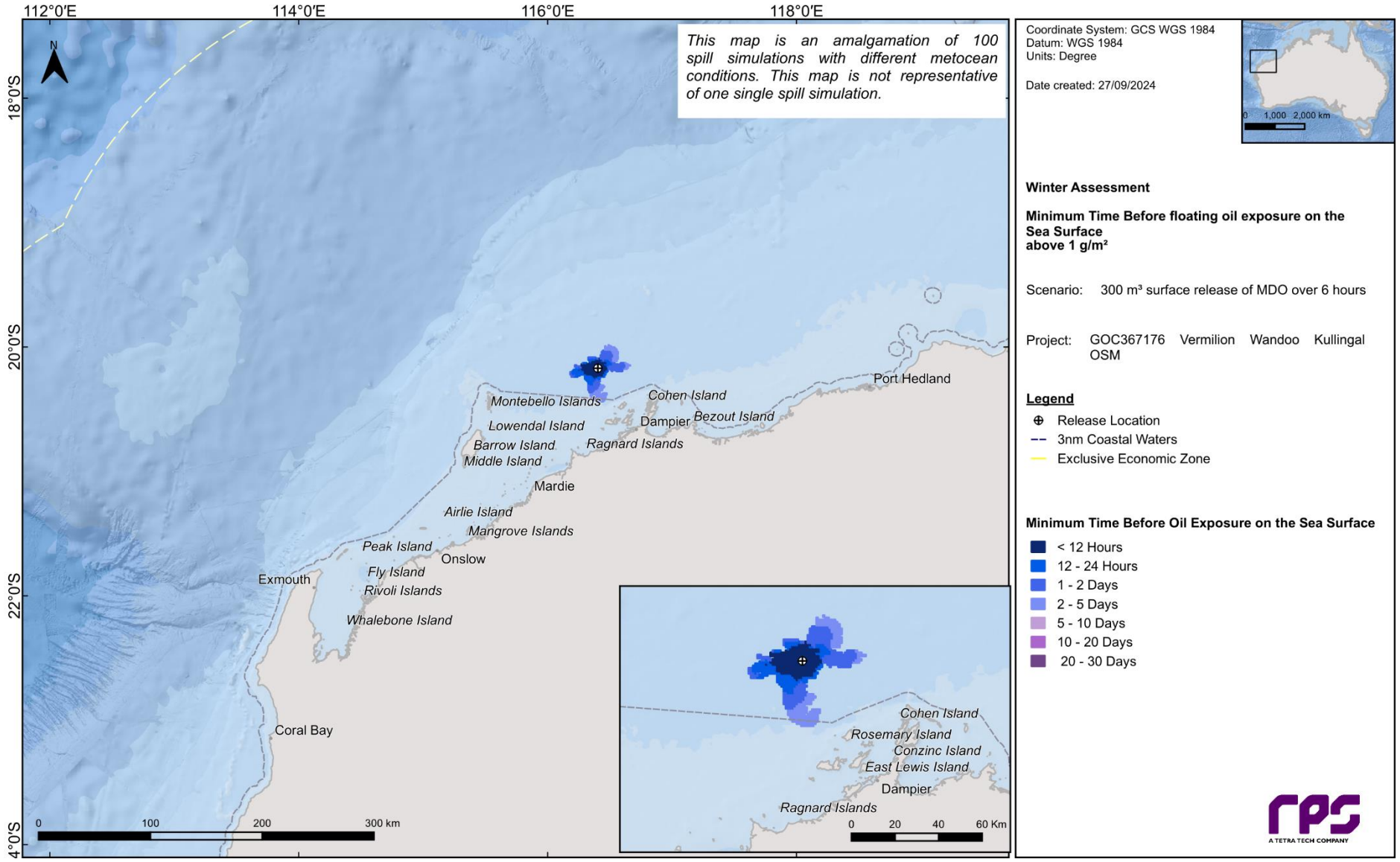

Figure 14.7 Minimum time before floating oil exposure at, or above, 1 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

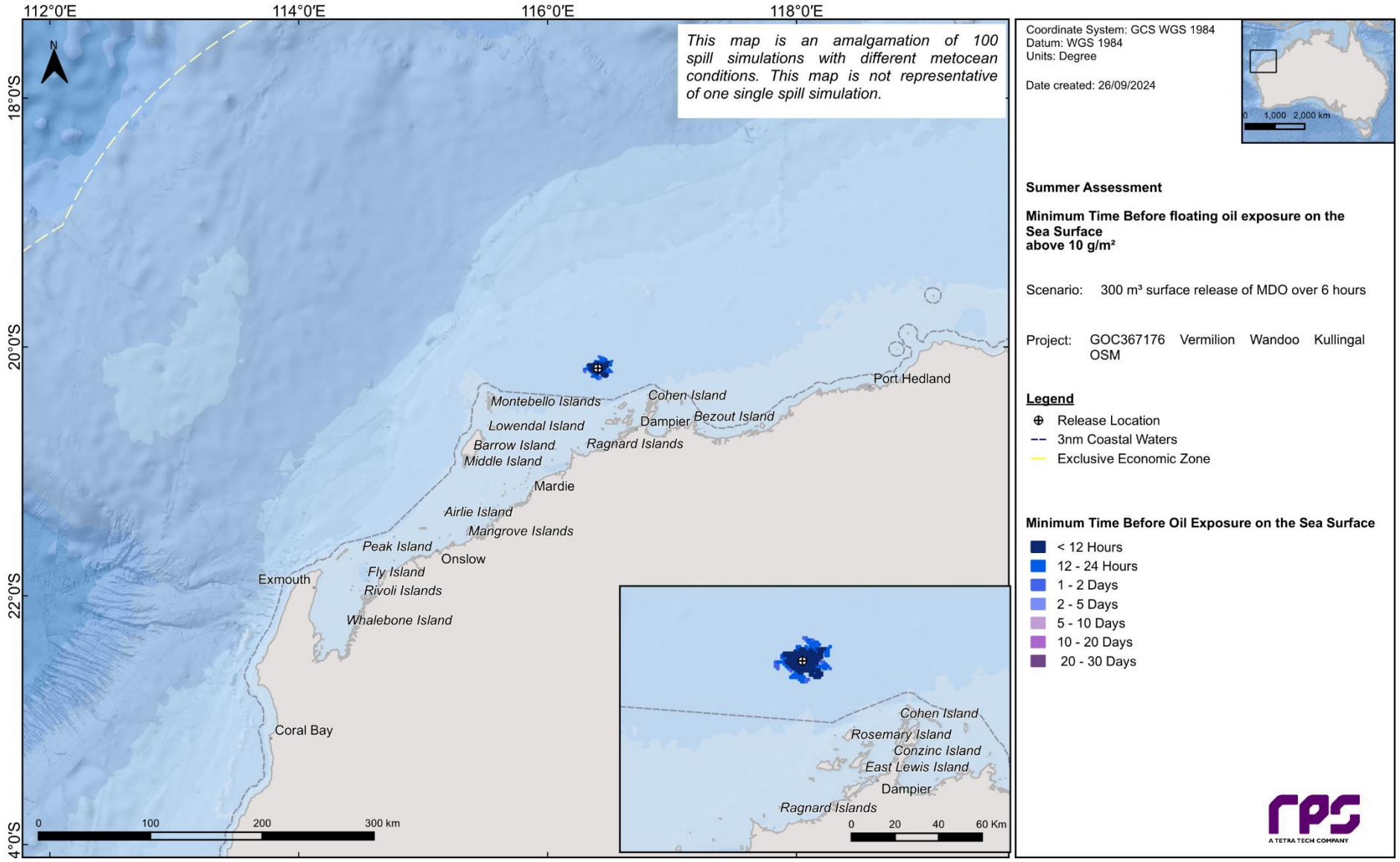

Figure 14.8 Minimum time before floating oil exposure at, or above, 10 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

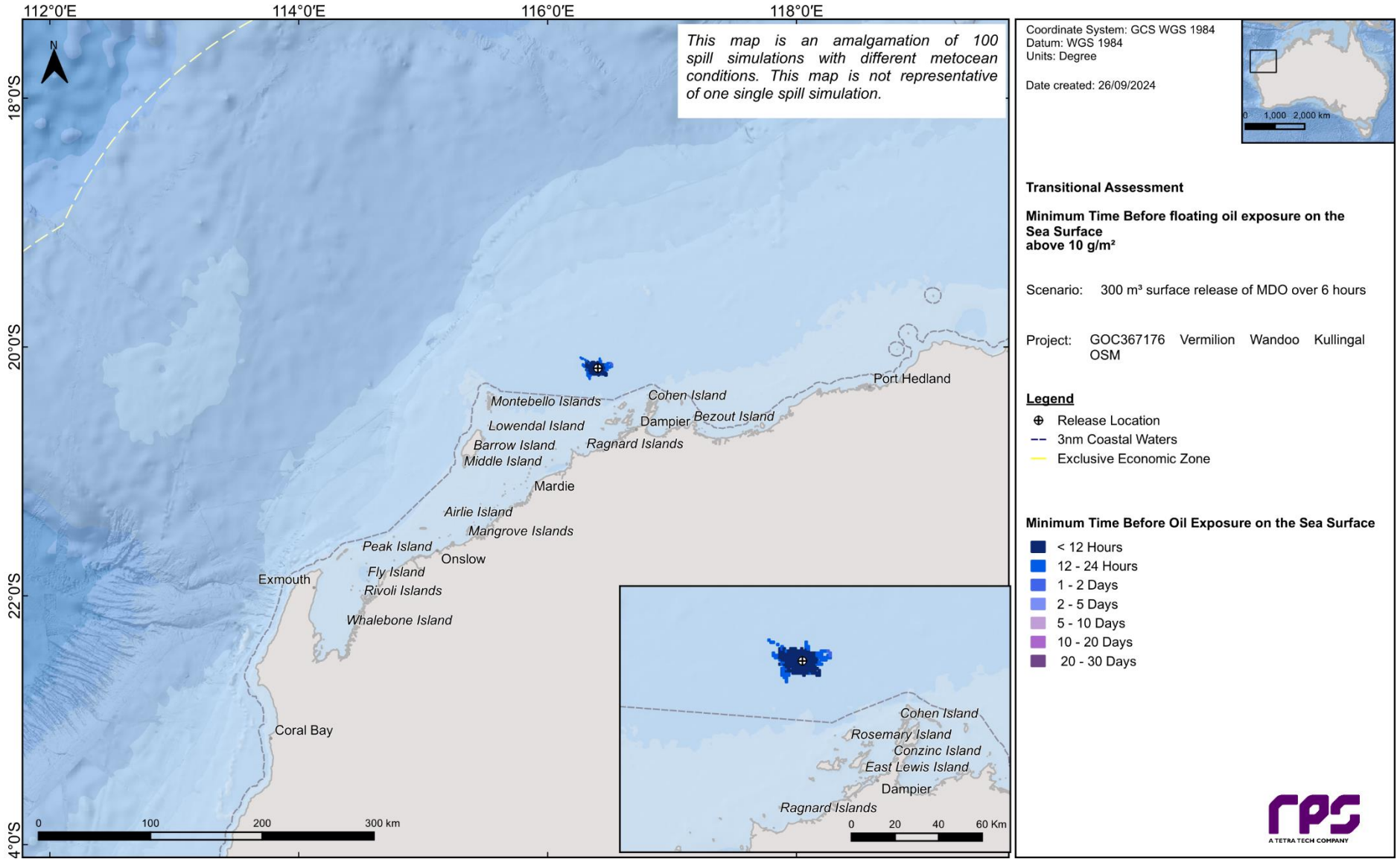

Figure 14.9 Minimum time before floating oil exposure at, or above, 10 g/m^2 following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

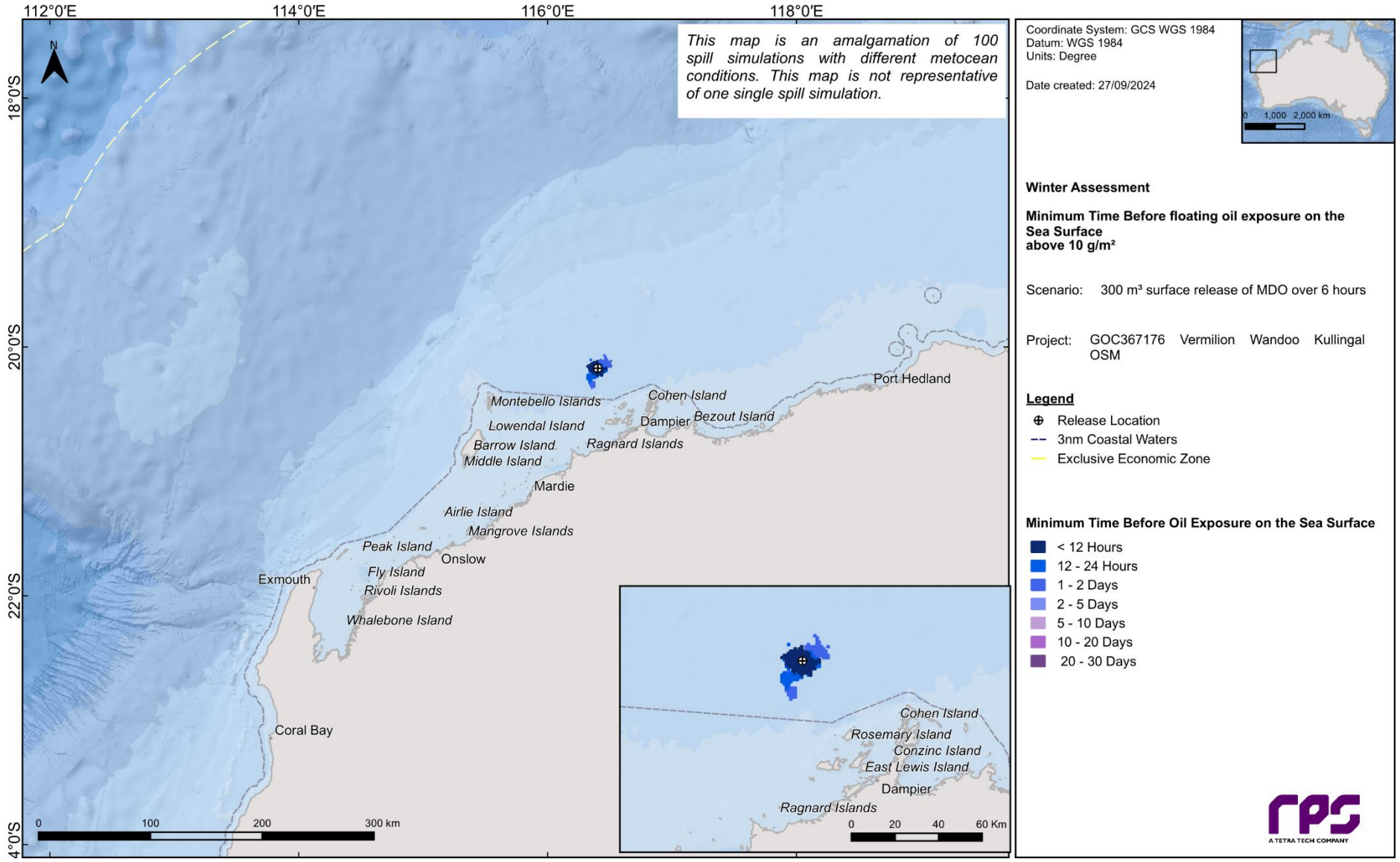

Figure 14.10 Minimum time before floating oil exposure at, or above, 10 g/m^2 following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

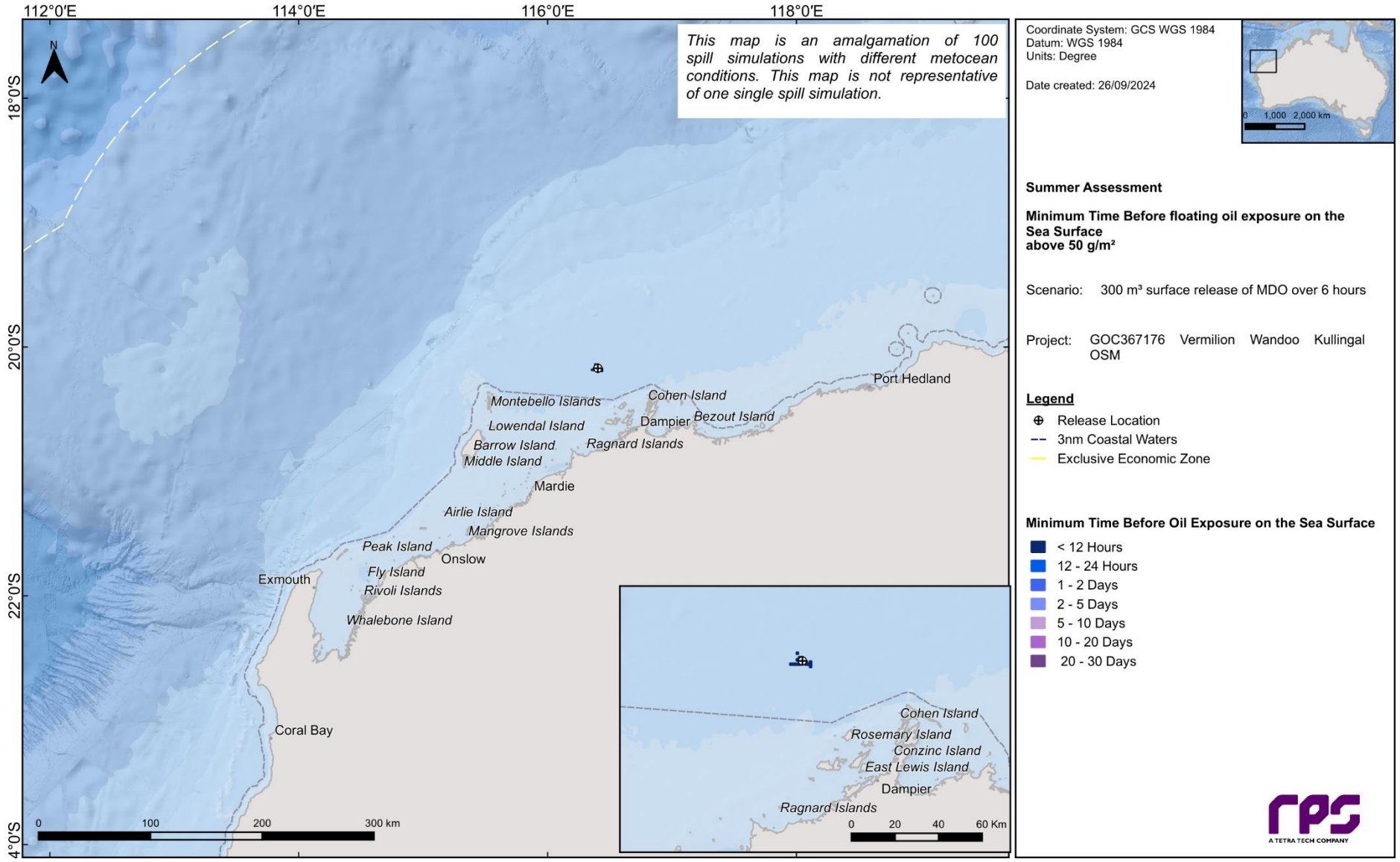

Figure 14.11 Minimum time before floating oil exposure at, or above, 50 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

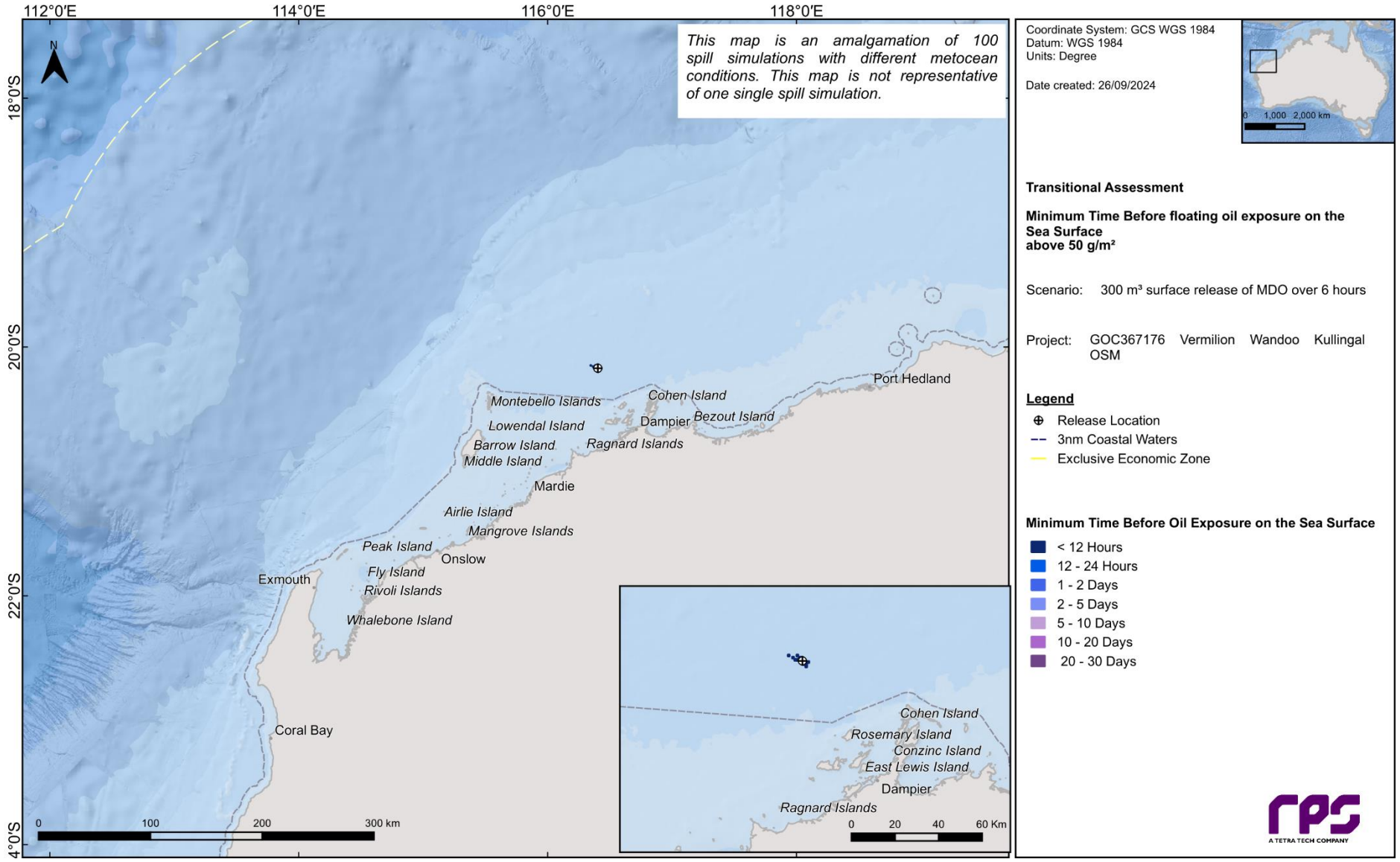

Figure 14.12 Minimum time before floating oil exposure at, or above, 50 g/m^2 following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

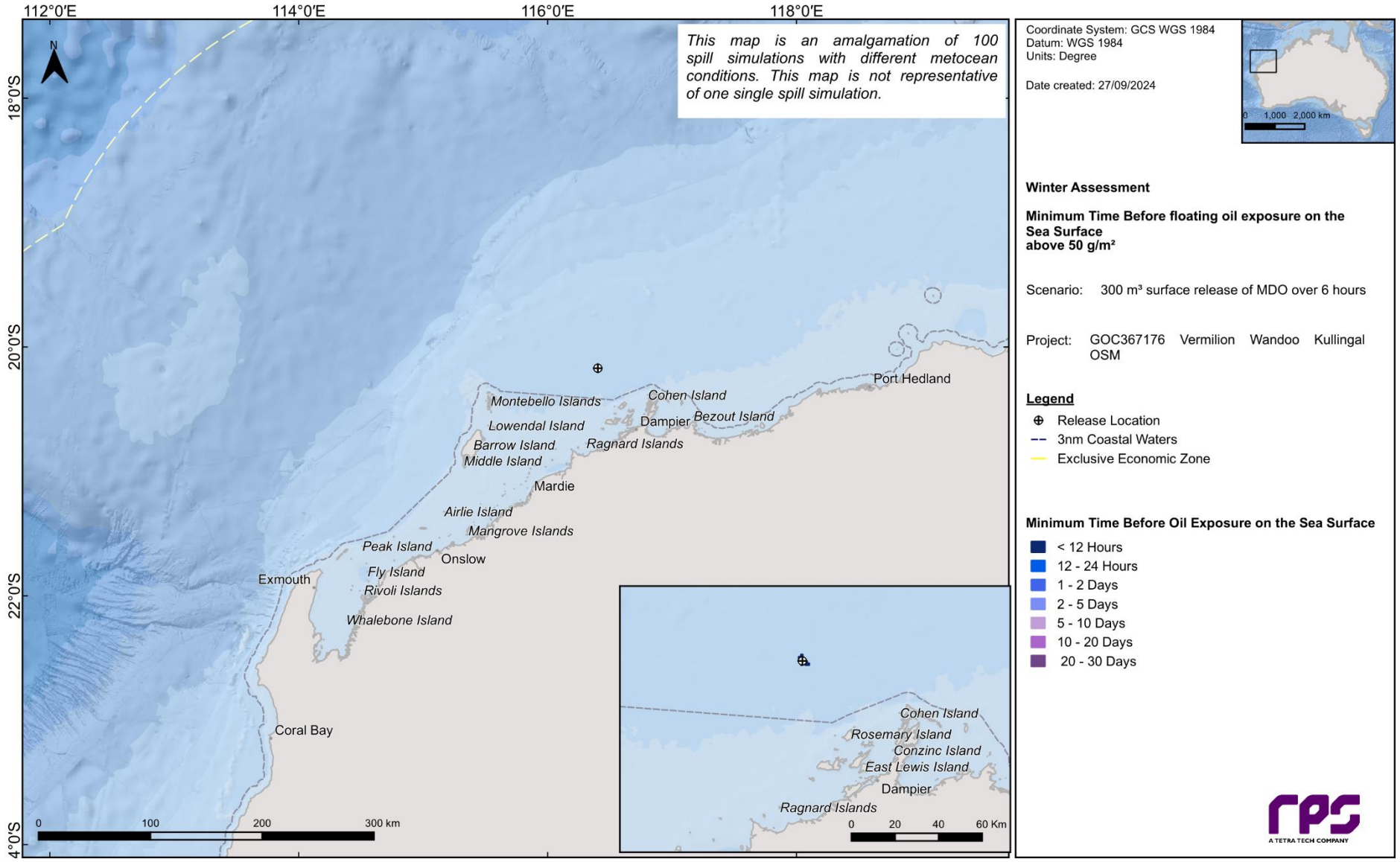

Figure 14.13 Minimum time before floating oil exposure at, or above, 50 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

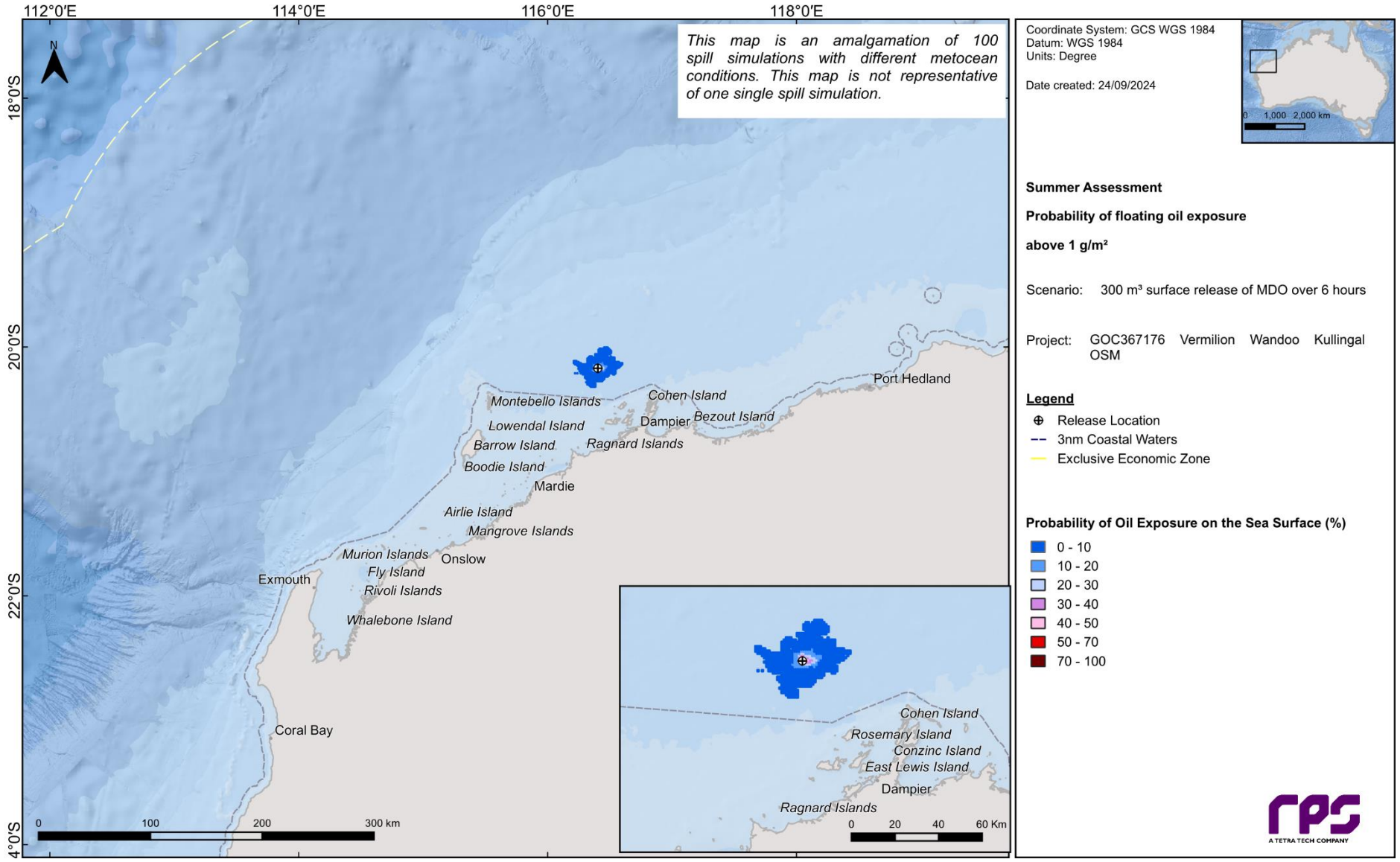

Figure 14.14 Probability of floating oil exposure at, or above, 1 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

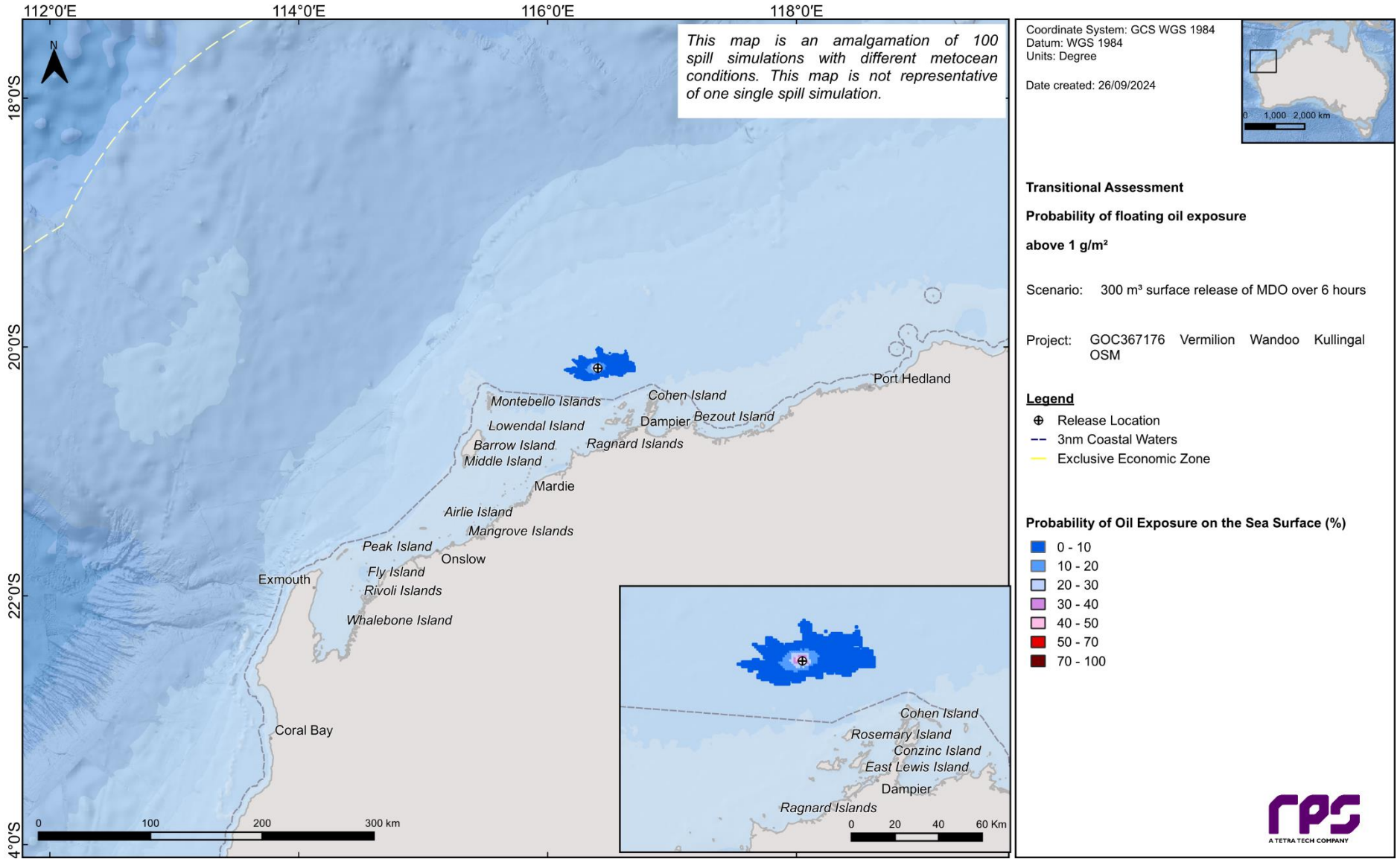

Figure 14.15 Probability of floating oil exposure at, or above, 1 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

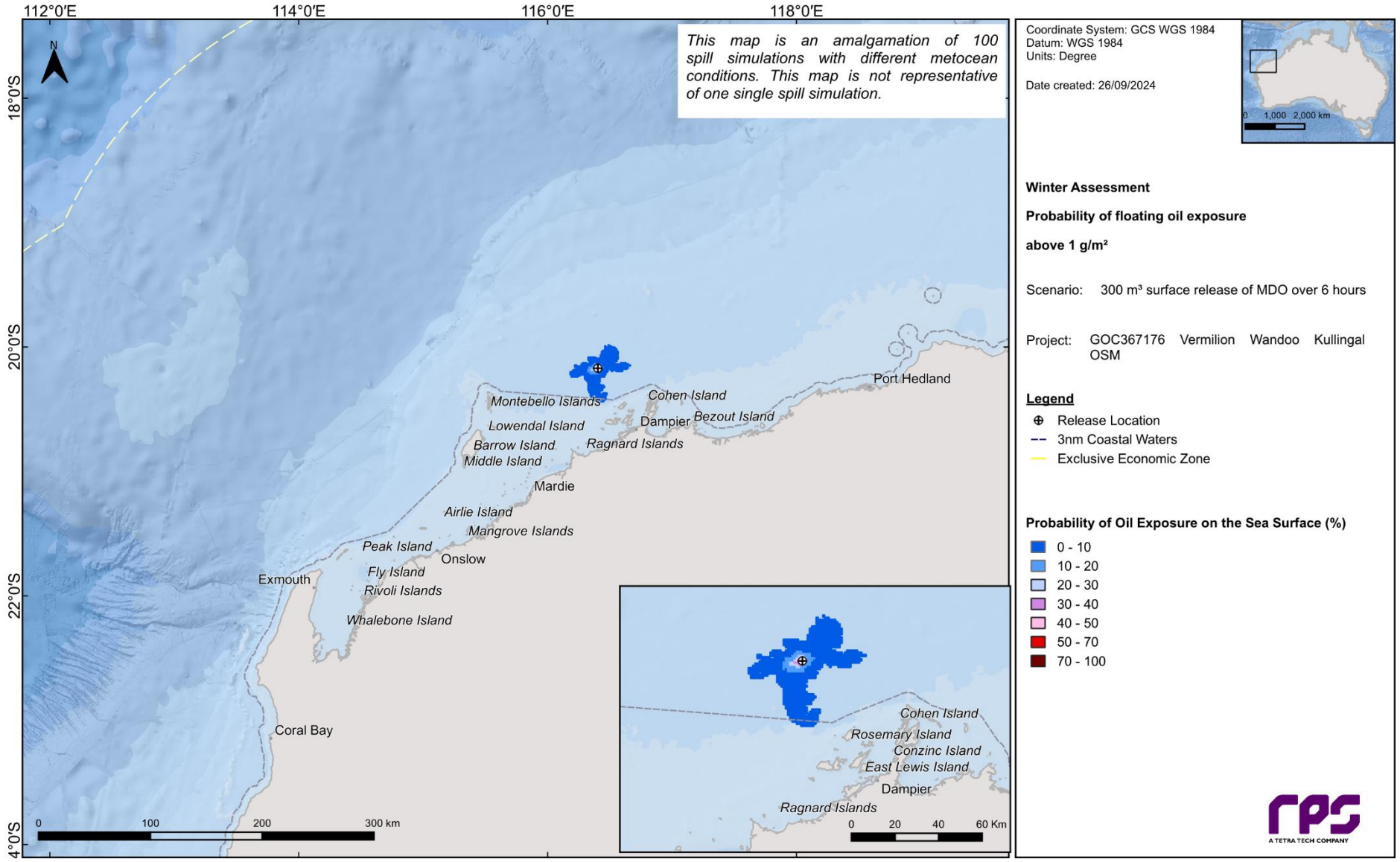

Figure 14.16 Probability of floating oil exposure at, or above, 1 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

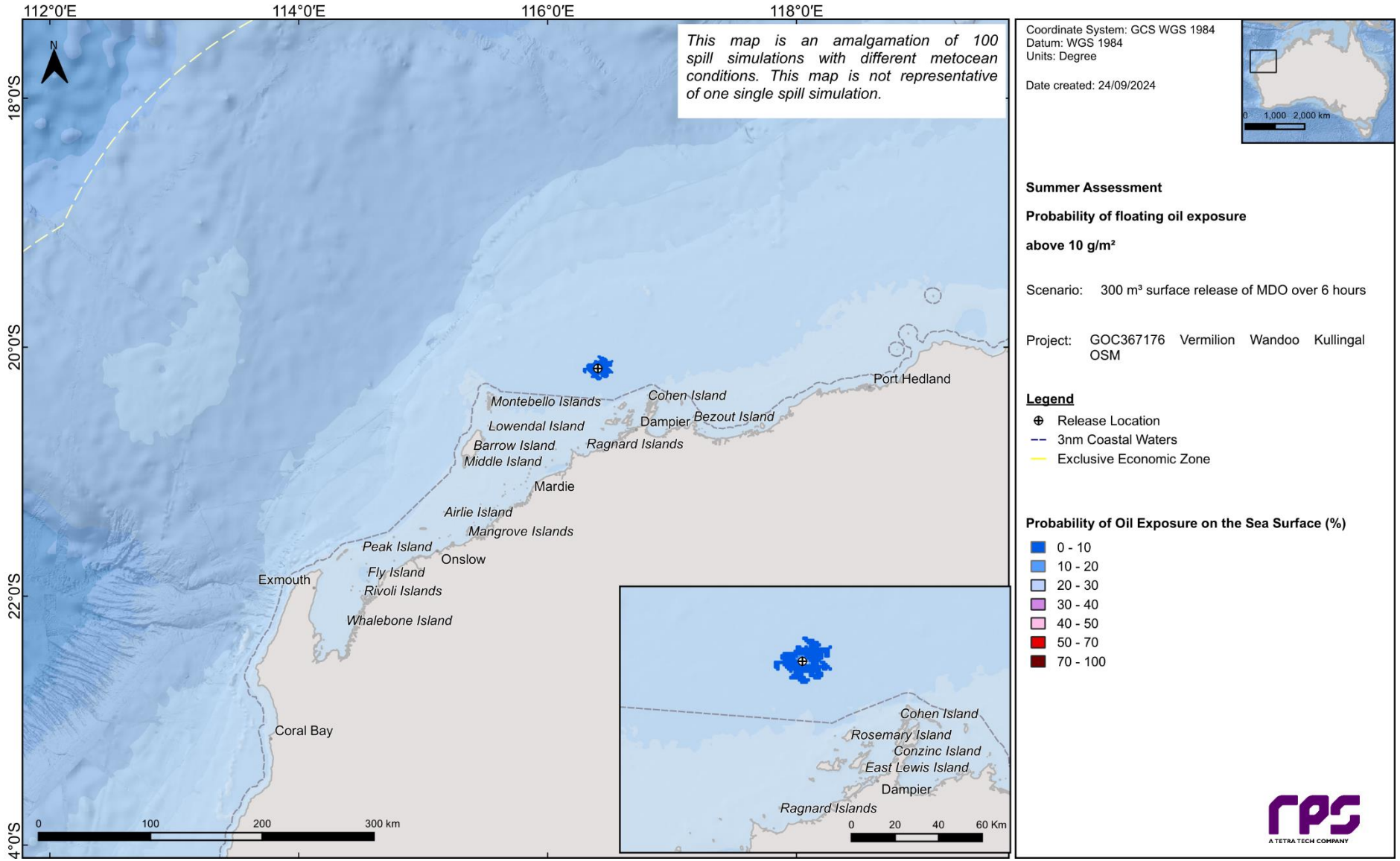

Figure 14.17 Probability of floating oil exposure at, or above, 10 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

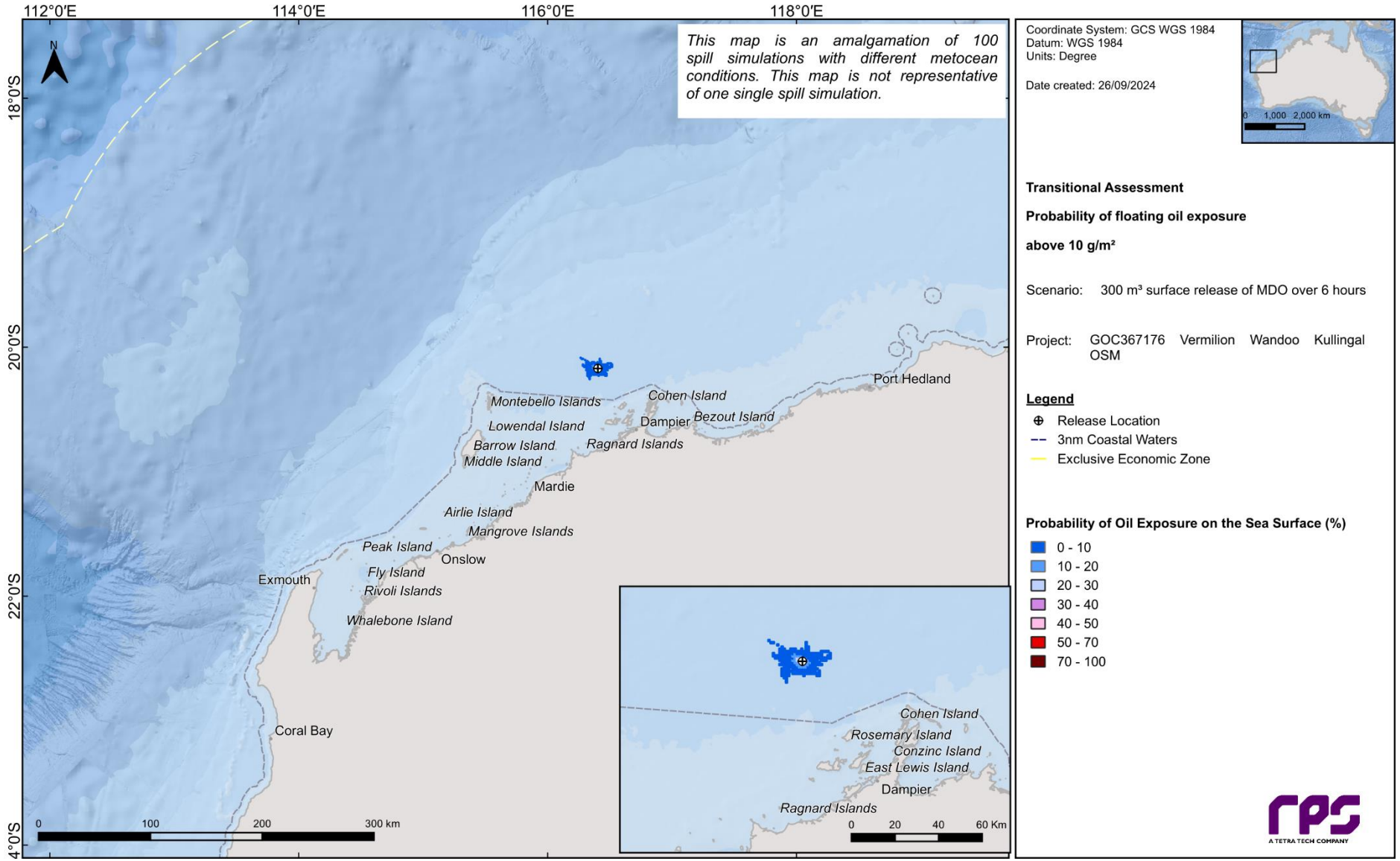

Figure 14.18 Probability of floating oil exposure at, or above, 10 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

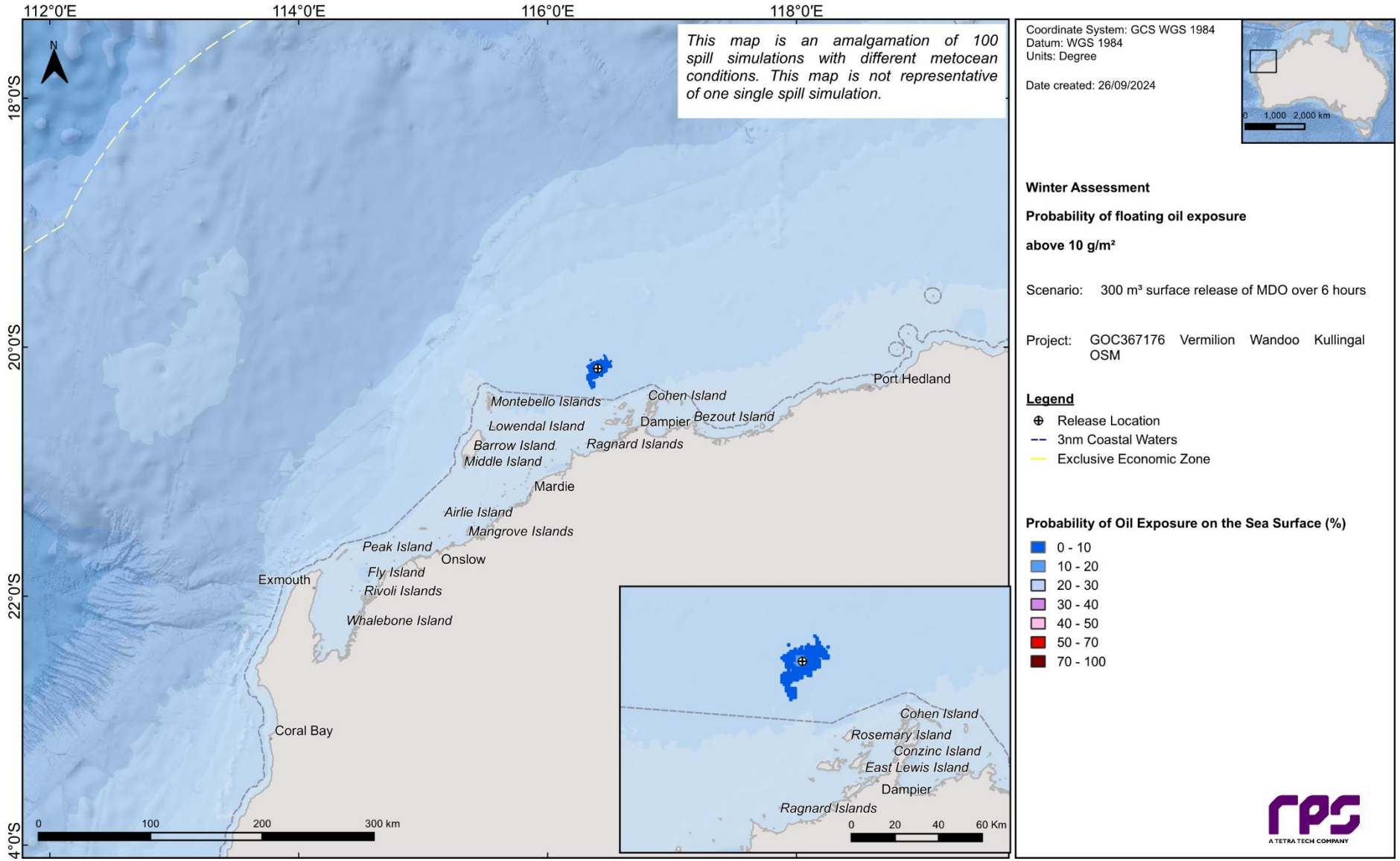

Figure 14.19 Probability of floating oil exposure at, or above, 10 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

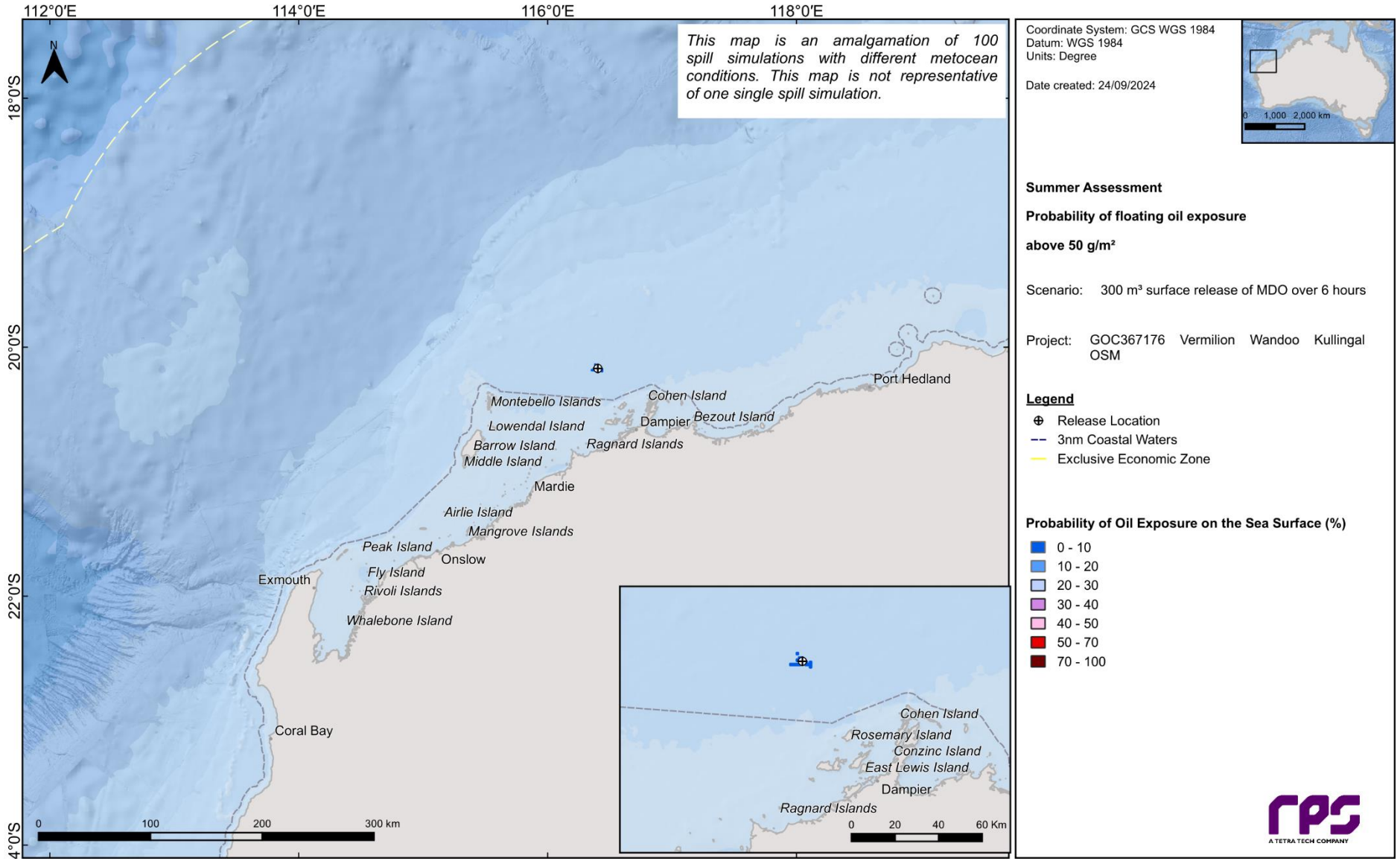

Figure 14.20 Probability of floating oil exposure at, or above, 50 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

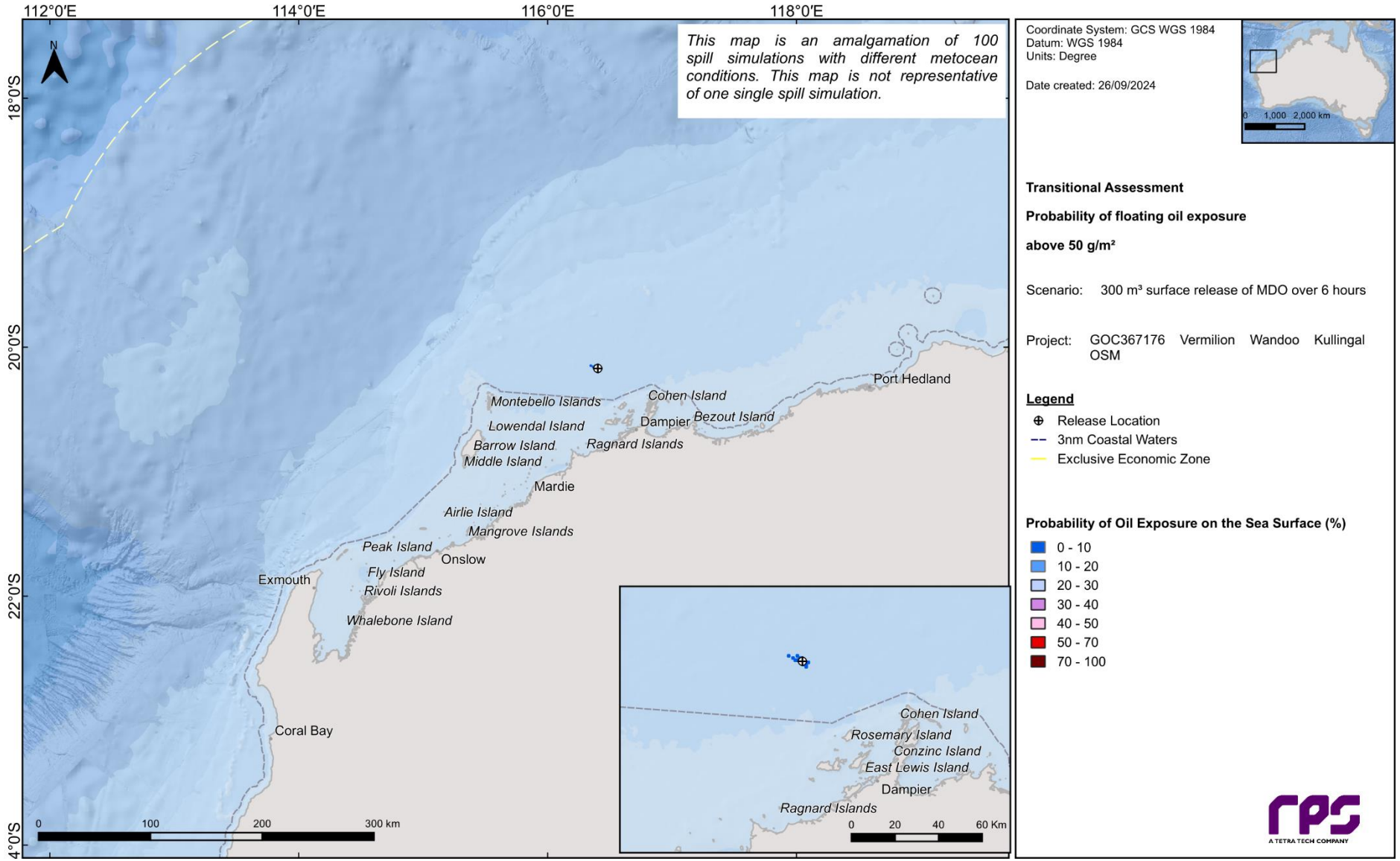

Figure 14.21 Probability of floating oil exposure at, or above, 50 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

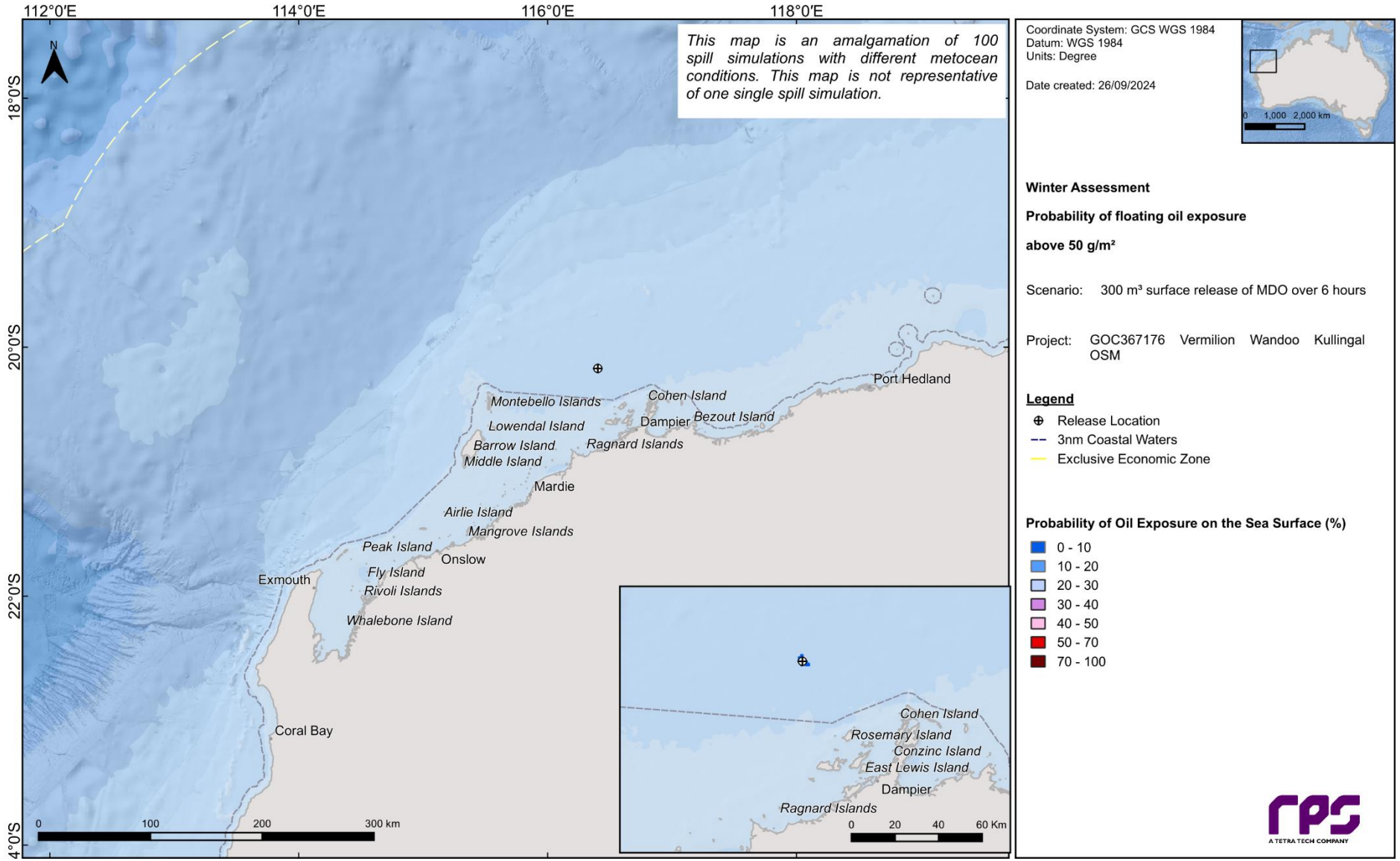

Figure 14.22 Probability of floating oil exposure at, or above, 50 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

14.1.3 Shoreline accumulation

Table 14.2 summarizes the predicted oil accumulation on shorelines across different seasons and thresholds. The highest probability of oil accumulation on any shoreline at, or above, the 10 g/m^2 threshold was recorded during winter, reaching 24%. The shortest time for oil to reach any shoreline at this threshold was 91 hours, also during winter. The maximum volume of oil ashore from a single spill was 23.2 m^3 also occurring during winter.

Table 14.3 to

Table 14.5 present the predicted oil accumulation for specific shoreline cells for each season.

The highest probability of shoreline oil accumulation at, or above, the 10 g/m^2 threshold was forecast for WA11.West (318) - Barrow Island and Montebello Islands (A), with probabilities of 2%, 6%, and 15% during the summer, transitional, and winter seasons, respectively. During summer, transitional and winter conditions, the same shoreline cell was predicted to experience quickest time before oil accumulation at 152 hours, 136 hours and 91 hours after the spill commencement. Additionally, the same shoreline cell recorded the highest volume of oil ashore with 23.2 m^3, during a spill simulation that commenced under winter conditions (see Table 14.5).

The seasonal maximum potential shoreline oil accumulation are presented in Figure 14.23 to Figure 14.25 and probabilities for each of the thresholds and seasons are presented in Figure 14.26 to Figure 14.30.

Table 14.2 Summary of oil accumulation on any shoreline following a vessel collision at Kullingal. Results were calculated from 100 spill simulations per season.

Shoreline statistics	Summer			Transitional			Winter		
	Shoreline accumulation thresholds			Shoreline accumulation thresholds			Shoreline accumulation thresholds		
	10 g/m^2	100 g/m^2	1,000 g/m^2	10 g/m^2	100 g/m^2	1,000 g/m^2	10 g/m^2	100 g/m^2	1,000 g/m^2
Probability of contact to any shoreline (%)	2	NC	NC	9	1	NC	24	6	NC
Absolute minimum time to shore (hours)	152	NC	NC	136	366	NC	91	110	NC
Maximum accumulated volume (m^3) from a single spill simulation	1.2	NC	NC	5.3	1.6	NC	23.2	20.3	NC
Average accumulated volume (m^3) across all spill simulations	<1	NC	NC	<1	<1	NC	1.0	<1	NC
Maximum length of shoreline (km) from a single spill simulation	5	NC	NC	19	1	NC	14	6	NC
Average length of shoreline (km) across all spill simulations	0.08	NC	NC	0.51	0.01	NC	1.55	0.23	NC

NC: No contact to receptor predicted for specified threshold.

Table 14.3 Summary of shoreline oil accumulation on WAMOPRA shoreline cells following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

WAMOPRA shoreline cells	Probability (%) of shoreline oil on receptors at			Minimum time to receptor (hours) for shoreline oil at			Maximum local accumulated concentration (g/m²)		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 10 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 100 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 1,000 g/m²		Maximum length of shoreline (km) with concentrations ≥ 10 g/m²		Maximum length of shoreline (km) with concentrations ≥ 100 g/m²		Maximum length of shoreline (km) with concentrations ≥ 1,000 g/m²	
	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	averaged over all replicate spills	in the worst replicate spill	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation
WA11.West (318) - Barrow Island and Montebello Islands (A)	2	NC	NC	152	NC	NC	<1	50	<1	2	NC	NC	NC	NC	<1	5	NC	NC	NC	NC

Table 14.4 Summary of shoreline oil accumulation on WAMOPRA shoreline cells following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

WAMOPRA shoreline cells	Probability (%) of shoreline oil on receptors at			Minimum time to receptor (hours) for shoreline oil at			Maximum local accumulated concentration (g/m²)		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 10 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 100 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 1,000 g/m²		Maximum length of shoreline (km) with concentrations ≥ 10 g/m²		Maximum length of shoreline (km) with concentrations ≥ 100 g/m²		Maximum length of shoreline (km) with concentrations ≥ 1,000 g/m²	
	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	averaged over all replicate spills	in the worst replicate spill	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation
WA11.West (318) - Barrow Island and Montebello Islands (A)	6	1	NC	136	366	NC	3.3	150	<1	4	<1	2	NC	NC	<1	11	<1	1	NC	NC
WA11.West (319) - Barrow Island and Montebello Islands (B)	1	NC	NC	158	NC	NC	<1	66	<1	3	NC	NC	NC	NC	<1	8	NC	NC	NC	NC
WA11.West (329) - Locker Point - Baresand Point	1	NC	NC	387	NC	NC	<1	18	<1	<1	NC	NC	NC	NC	<1	2	NC	NC	NC	NC

Table 14.5 Summary of shoreline oil accumulation on WAMOPRA shoreline cells following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

WAMOPRA shoreline cells	Probability (%) of shoreline oil on receptors at			Minimum time to receptor (hours) for shoreline oil at			Maximum local accumulated concentration (g/m²)		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 10 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 100 g/m²		Maximum accumulated volume (m³) along this shoreline with concentrations ≥ 1,000 g/m²		Maximum length of shoreline (km) with concentrations ≥ 10 g/m²		Maximum length of shoreline (km) with concentrations ≥ 100 g/m²		Maximum length of shoreline (km) with concentrations ≥ 1,000 g/m²	
	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	≥ 10 g/m²	≥ 100 g/m²	≥ 1,000 g/m²	averaged over all replicate spills	in the worst replicate spill	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation	averaged over all replicate simulations	in the worst replicate simulation
WA11.West (318) - Barrow Island and Montebello Islands (A)	15	6	NC	91	110	NC	26	634	<1	23	<1	21	NC	NC	2	14	<1	6	NC	NC
WA11.West (319) - Barrow Island and Montebello Islands (B)	4	NC	NC	163	NC	NC	1.4	41	<1	2	NC	NC	NC	NC	<1	6	NC	NC	NC	NC
WA11.West (321) - Barrow Island and Montebello Islands (D)	1	NC	NC	412	NC	NC	<1	22	<1	<1	NC	NC	NC	NC	<1	1	NC	NC	NC	NC
WA11.West (326) - Baresand Point - Entrance Point E	1	NC	NC	265	NC	NC	<1	17	<1	<1	NC	NC	NC	NC	<1	3	NC	NC	NC	NC
WA11.West (329) - Locker Point - Baresand Point	4	NC	NC	276	NC	NC	1.4	21	<1	<1	NC	NC	NC	NC	<1	6	NC	NC	NC	NC

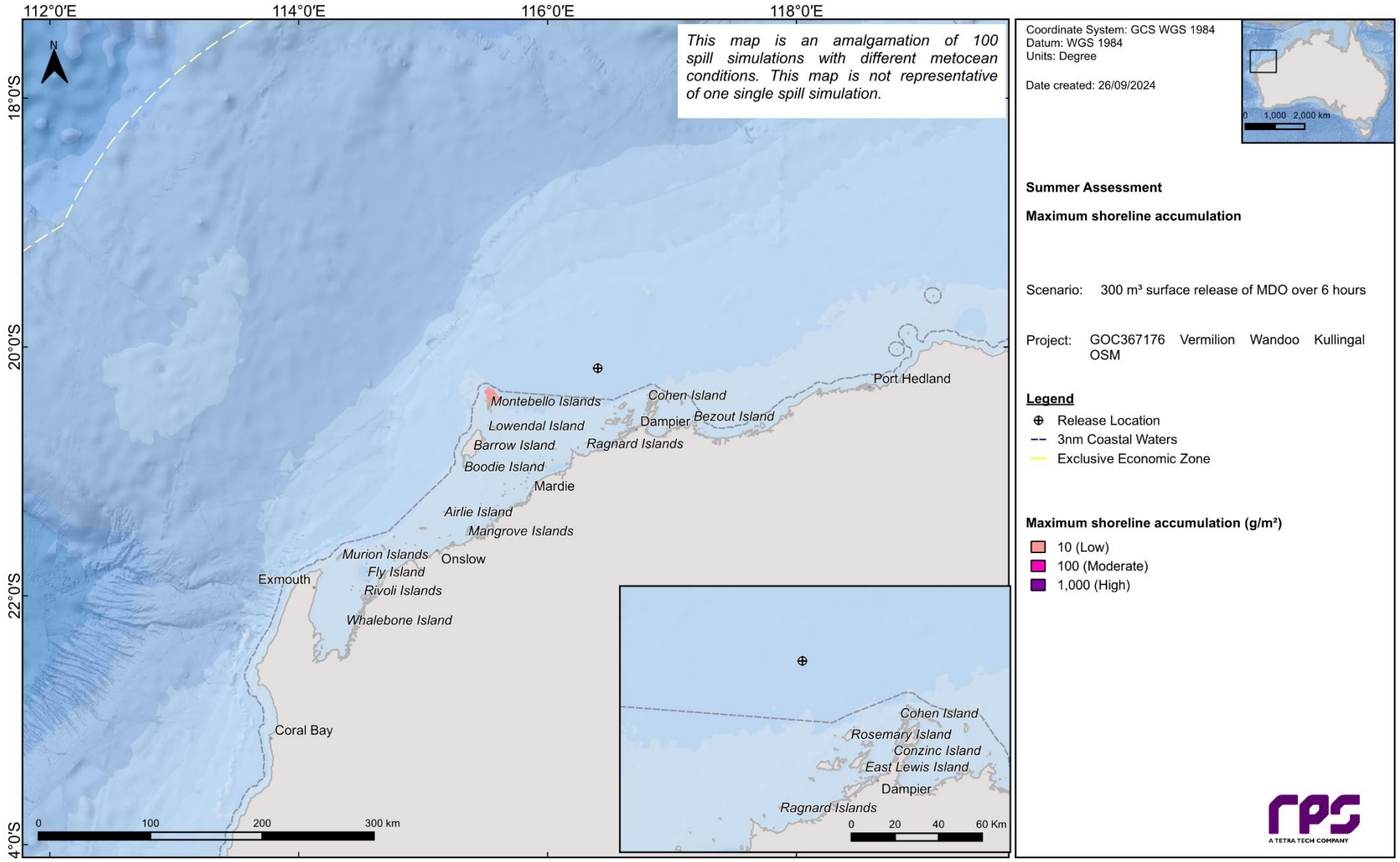

Figure 14.23 Maximum potential shoreline oil accumulation following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

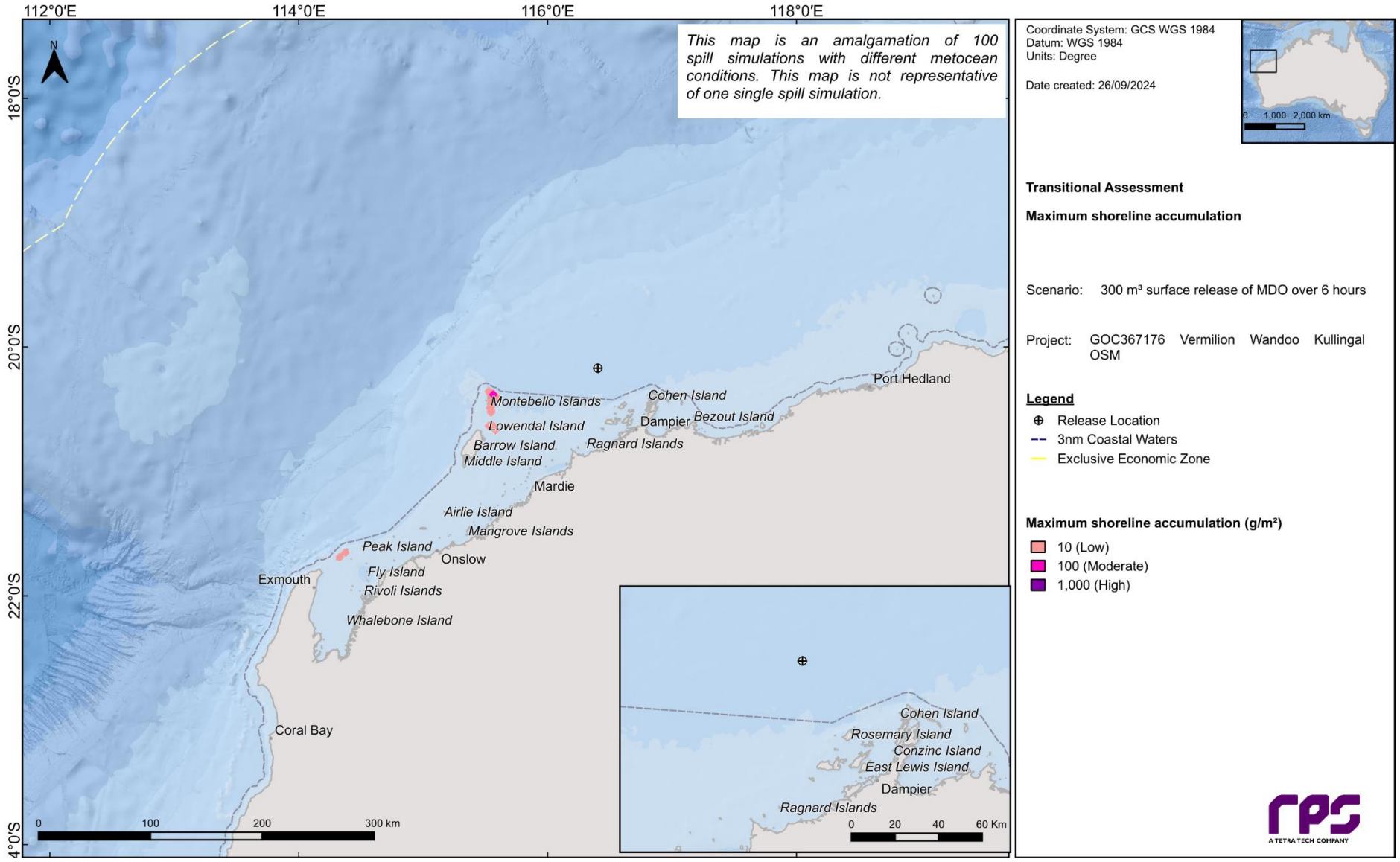

Figure 14.24 Maximum potential shoreline oil accumulation following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

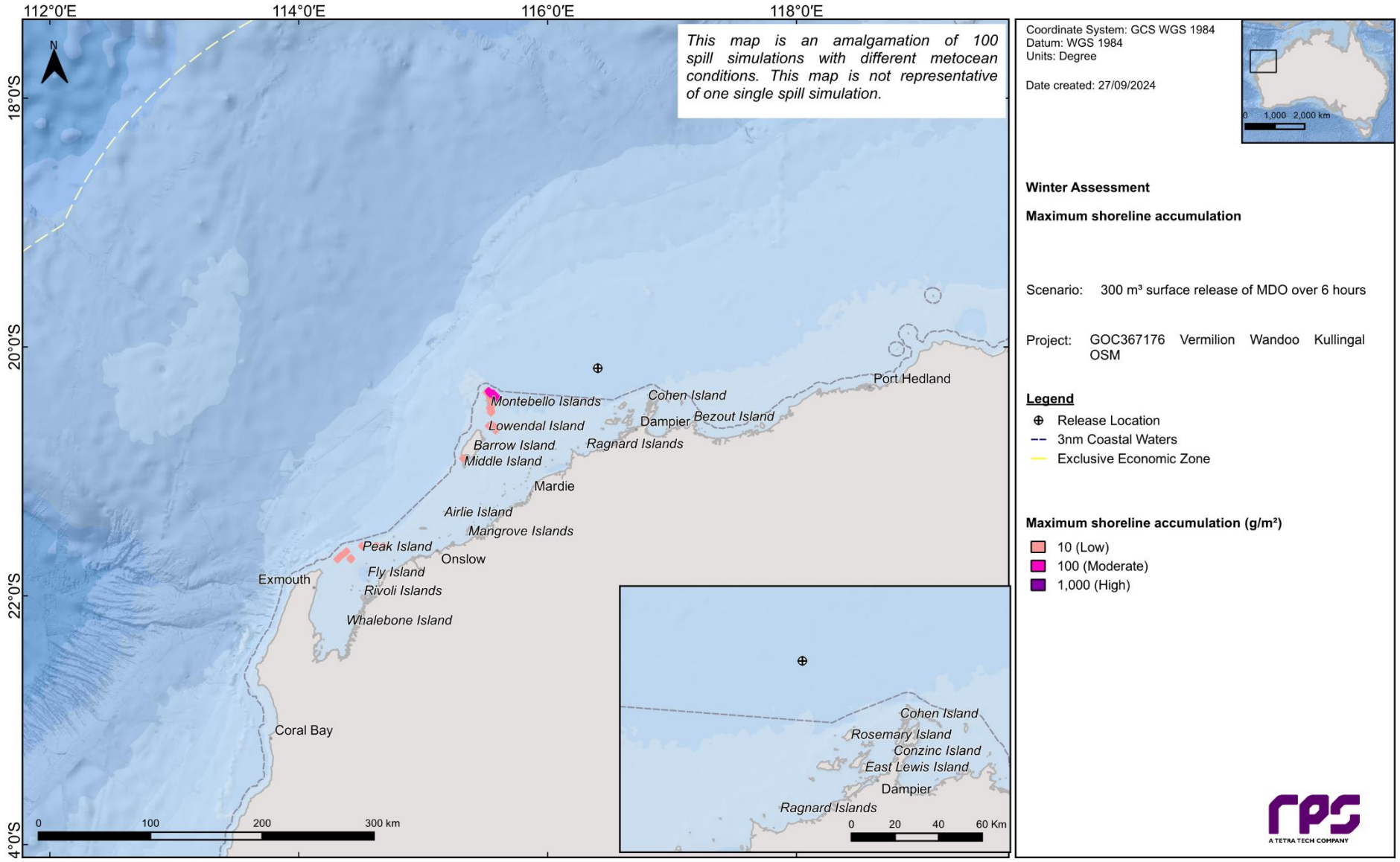

Figure 14.25 Maximum potential shoreline oil accumulation following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

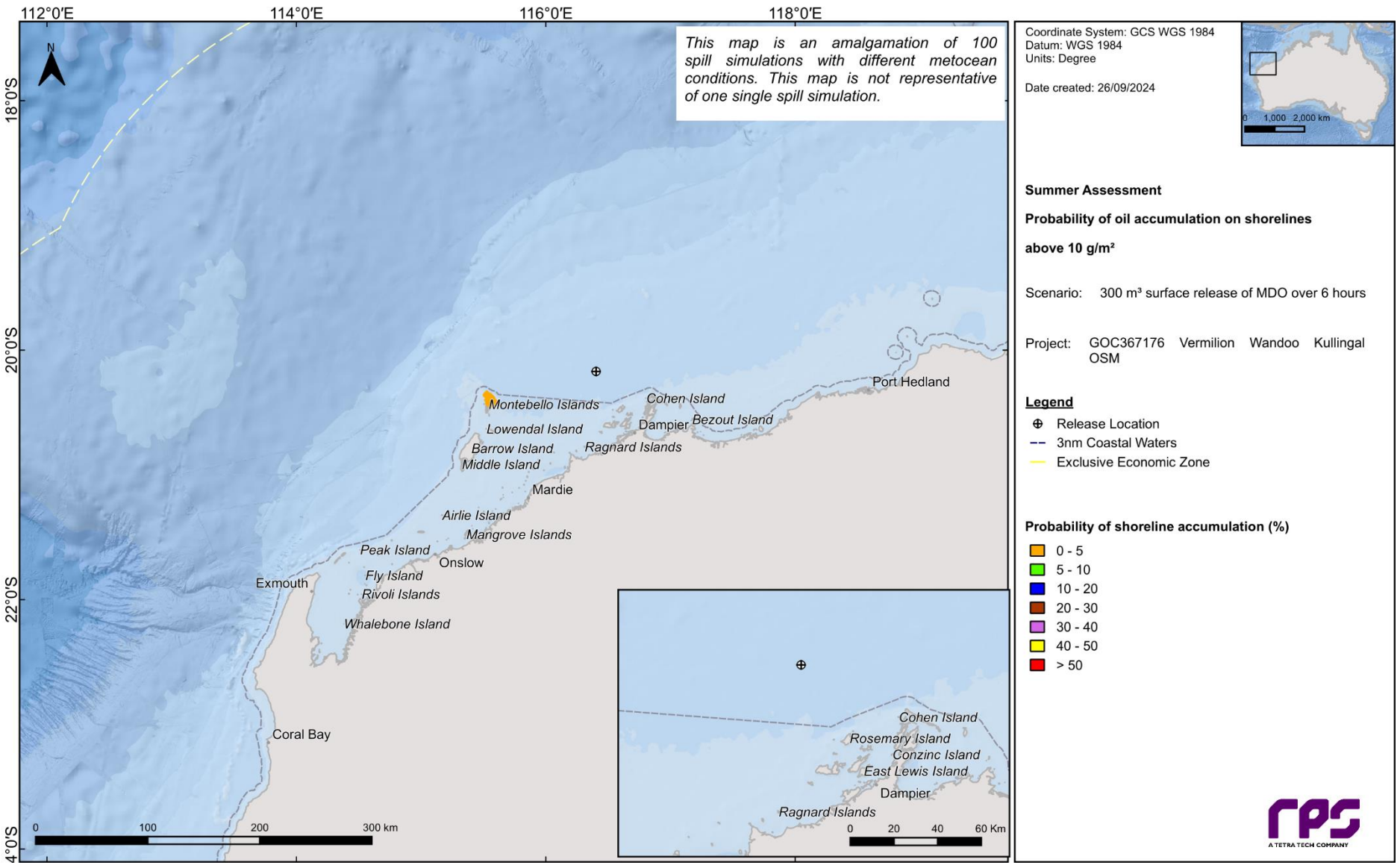

Figure 14.26 Predicted probability of shoreline oil accumulation at, or above, 10 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

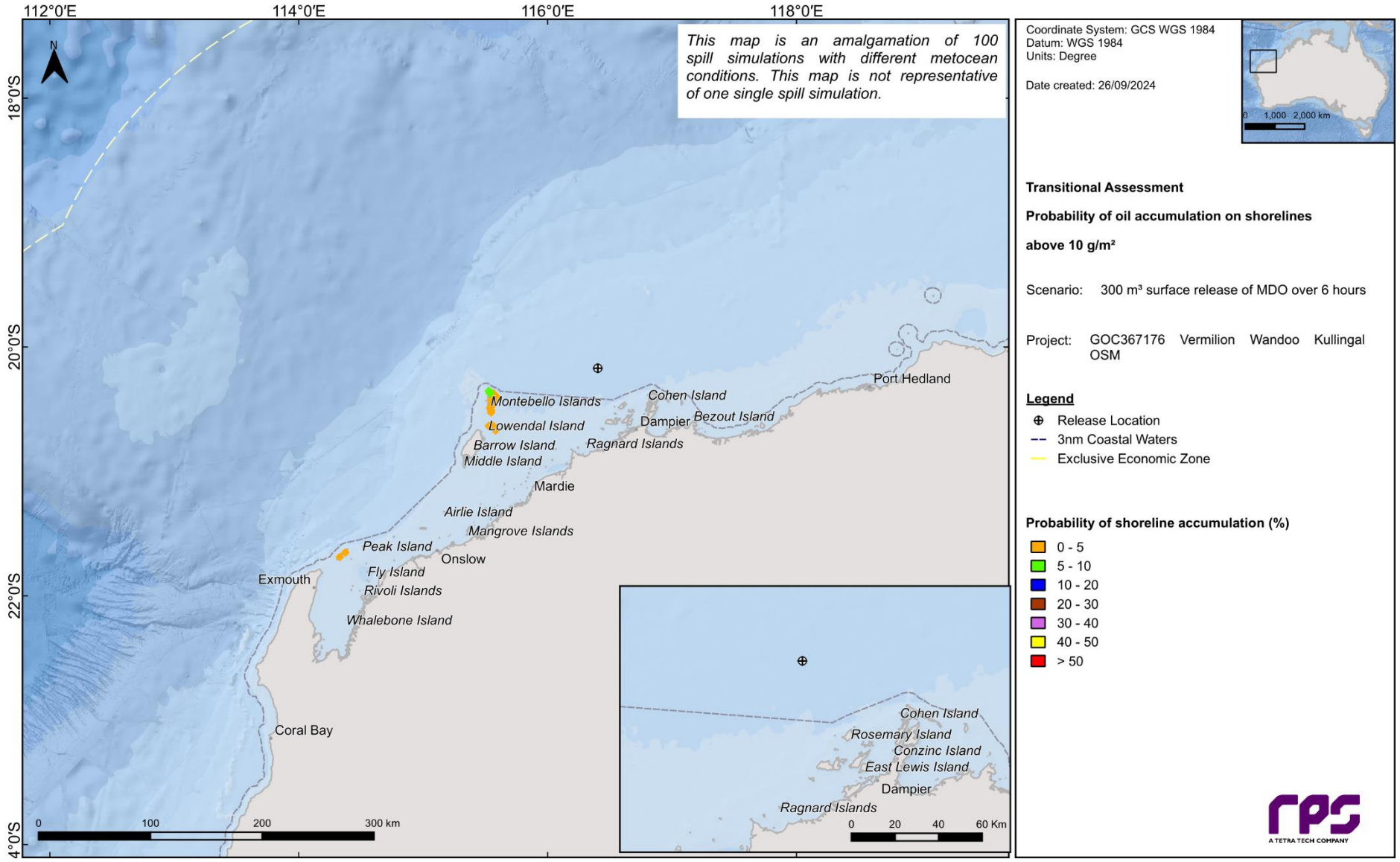

Figure 14.27 Predicted probability of shoreline oil accumulation at, or above, 10 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

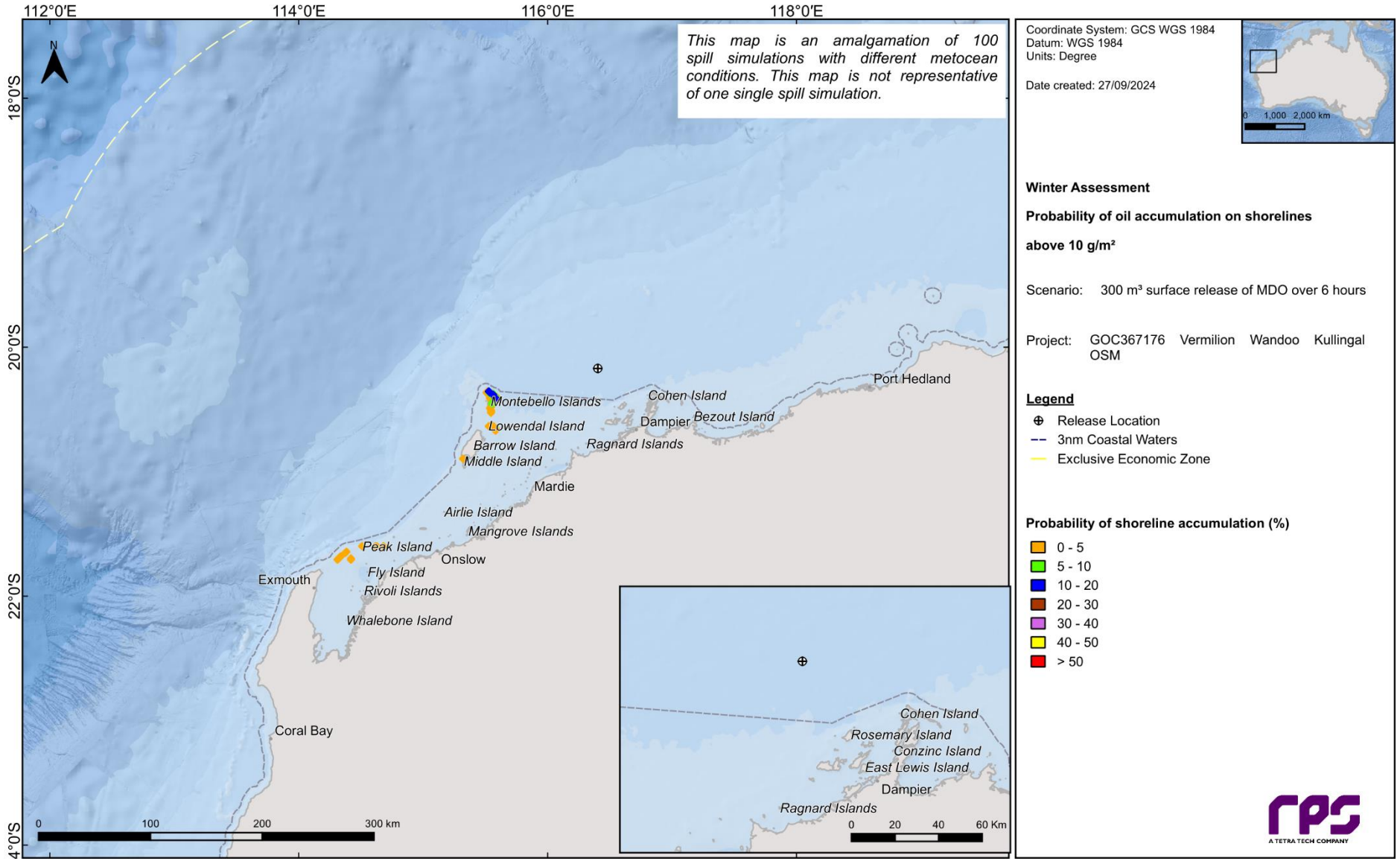

Figure 14.28 Predicted probability of shoreline oil accumulation at, or above, 10 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

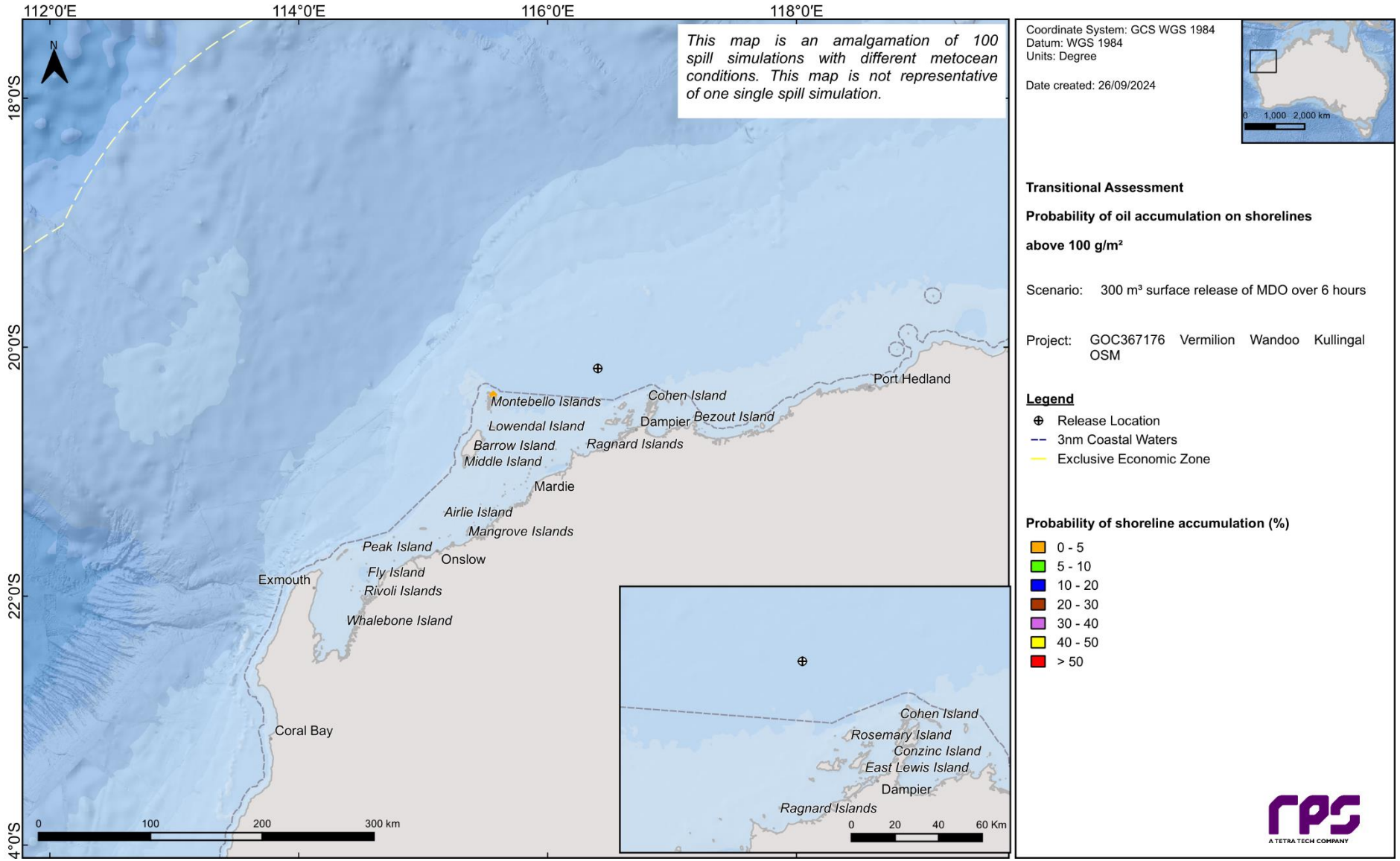

Figure 14.29 Predicted probability of shoreline oil accumulation at, or above, 100 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

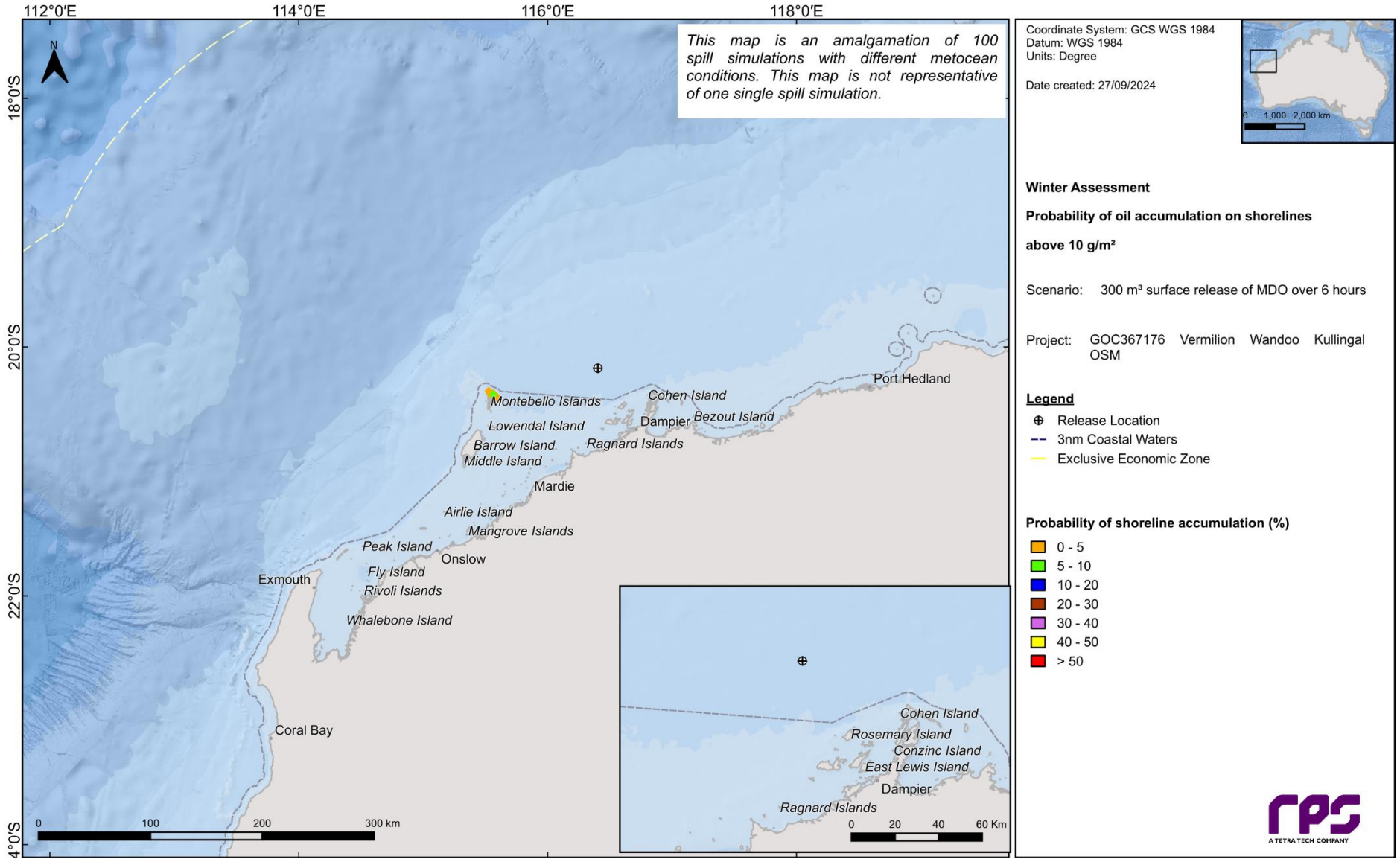

Figure 14.30 Predicted probability of shoreline oil accumulation at, or above, 100 g/m² following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

14.1.4 In-water exposure

14.1.4.1 Dissolved Hydrocarbons

Table 14.6 summarises the maximum distances from the release location to the dissolved hydrocarbon exposure thresholds for each season. Concentrations exceeding 10 ppb may potentially extend up to 169 km from the release location. As the threshold increases to 50 ppb, the maximum distance decreases to 58 km. No exposure was predicted above 400 ppb.

Table 14.7 summarises the predicted dissolved hydrocarbon exposure to receptors (either at, or above, receptors in the water column).

The Montebello AMP recorded the highest probabilities of exposure at, or above, 10 ppb during summer (2%), transitional (4%) and winter (7%) conditions. The same receptor recorded the quickest time to exposure during transitional conditions (27 hours). The Montebello AMP also recorded the highest concentration at 41 ppb during winter conditions.

Figure 14.31 to Figure 14.33 illustrate the dissolved hydrocarbon exposure zones for the three seasons, whilst Figure 14.34 to Figure 14.45 show the minimum times before exposure and probabilities of exposure at or above, 10 ppb and 50 ppb.

Seasonal cross-sectional transects (north-south and east-west) of the maximum dissolved hydrocarbons in the vicinity of the release site are presented in Figure 14.46 to Figure 14.51.

Table 14.6 Maximum distances from the release location to dissolved hydrocarbon exposure thresholds following a vessel collision at Kullingal. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Dissolved hydrocarbon exposure thresholds		
		10 ppb	50 ppb	400 ppb
Summer	Maximum distance (km) from release location	148	32	-
	Direction	East	Northeast	-
Transitional	Maximum distance (km) from release location	155	58	-
	Direction	Southwest	West	-
Winter	Maximum distance (km) from release location	169	31	-
	Direction	Southwest	West	-

Table 14.7 Receptors predicted to be exposed by dissolved hydrocarbons following a vessel collision at Kullingal. Results were calculated from100 spill simulations per season.

Category	Name	Summer								Transitional								Winter							
		Probability (%) of dissolved concentration			Minimum time to receptor waters (hours) at			Maximum dissolved hydrocarbon concentration (ppb)		Probability (%) of dissolved concentration			Minimum time to receptor waters (hours) at			Maximum dissolved hydrocarbon concentration (ppb)		Probability (%) of dissolved concentration			Minimum time to receptor waters (hours) at			Maximum dissolved hydrocarbon concentration (ppb)	
		≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	averaged over all replicate spills	in the worst replicate	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	averaged over all replicate spills	in the worst replicate	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	≥ 10 ppb	≥ 50 ppb	≥ 400 ppb	averaged over all replicate spills	in the worst replicate
AMP	Montebello	2	NC	NC	33	NC	NC	<1	29	4	1	NC	31	51	NC	2	56	7	NC	NC	27	NC	NC	2	41
KEF	Glomar Shoals	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	121	NC	NC	<1	16	1	NC	NC	81	NC	NC	<1	18
MP	Montebello Islands	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	NC	79	NC	NC	<1	26	1	NC	NC	79	NC	NC	<1	26
State and Territory Waters	WA	1	NC	NC	26	NC	NC	<1	29	1	NC	NC	42	NC	NC	<1	26	1	NC	NC	42	NC	NC	<1	26

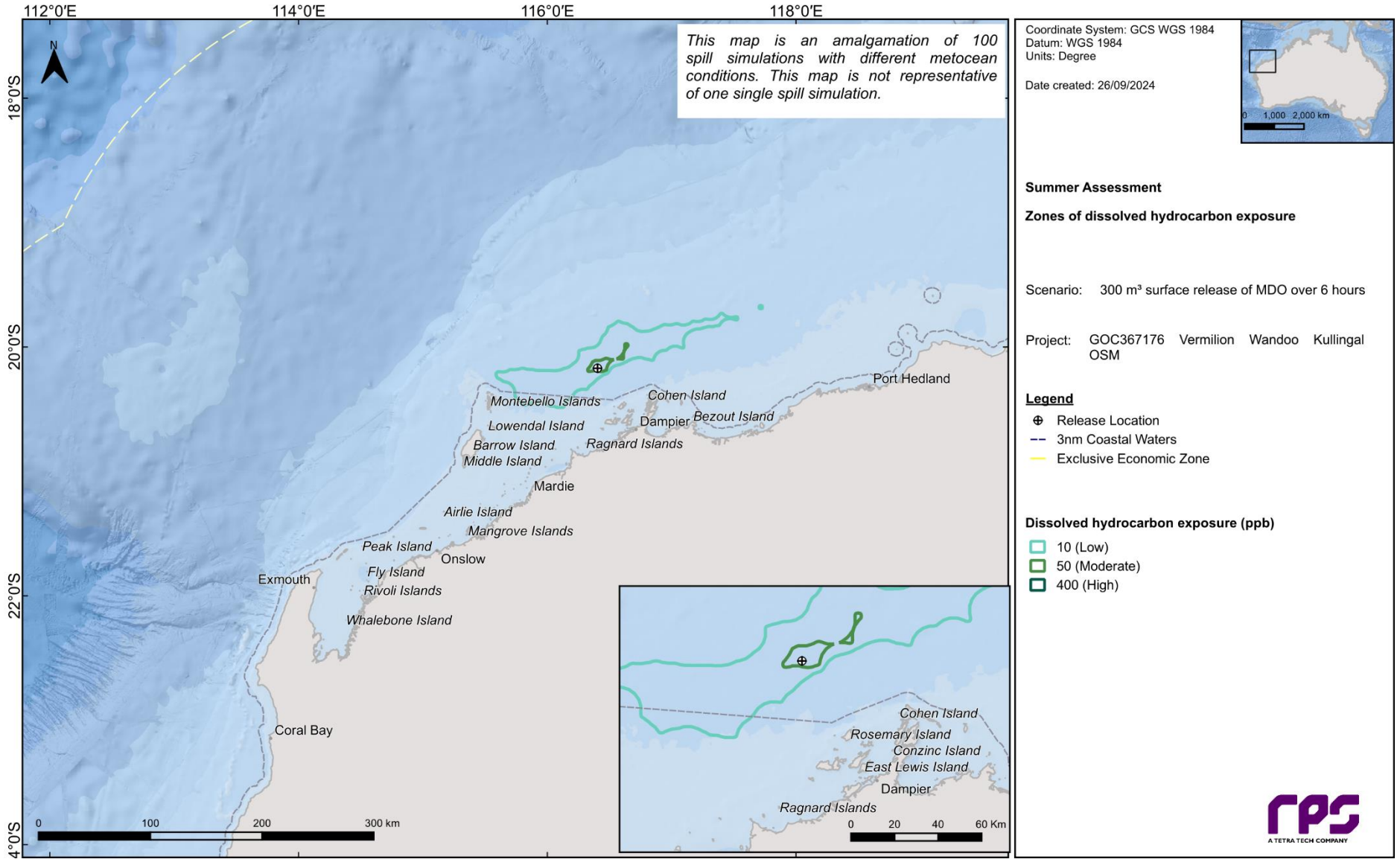

Figure 14.31 Predicted zones of dissolved hydrocarbon exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

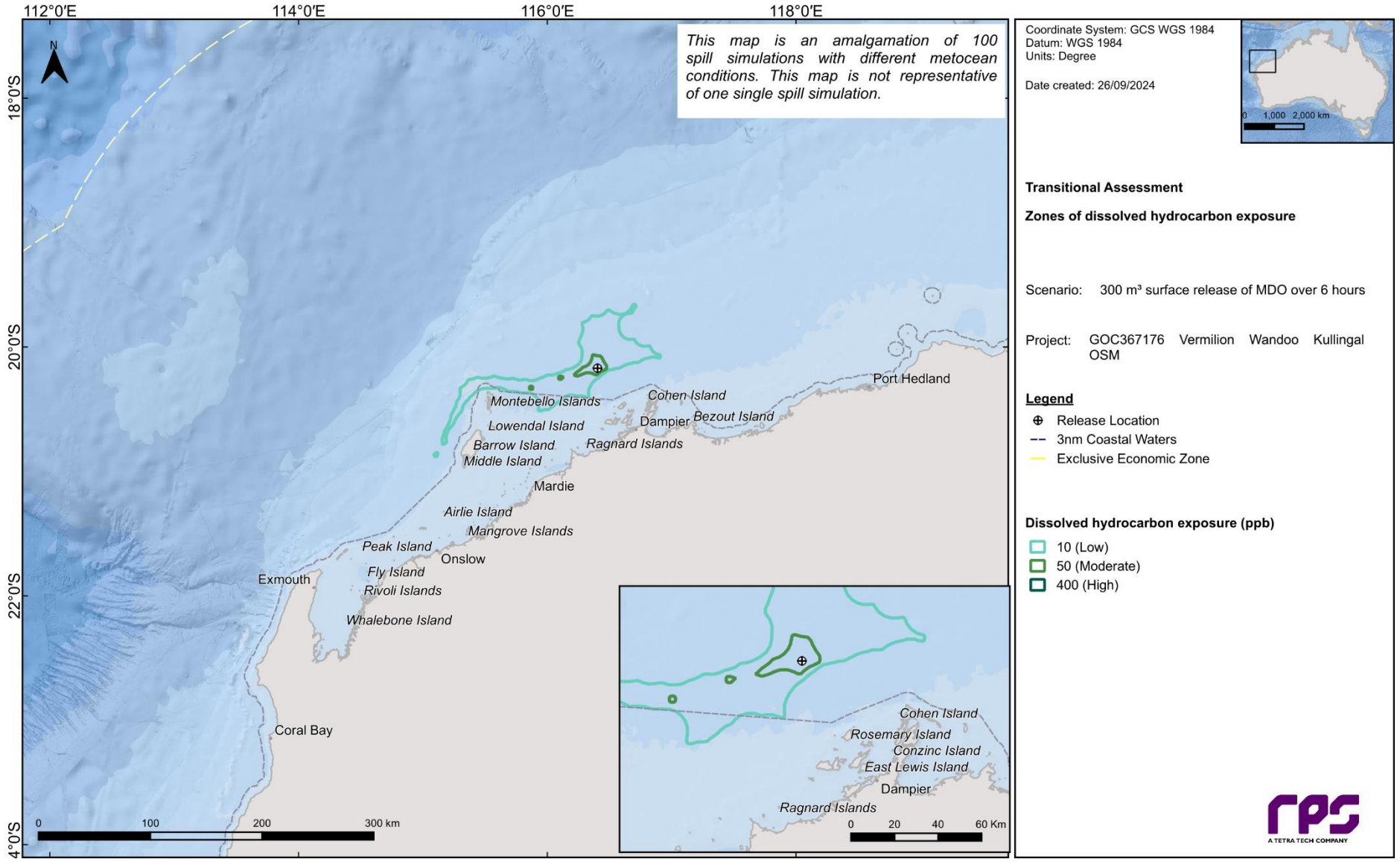

Figure 14.32 Predicted zones of dissolved hydrocarbon exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

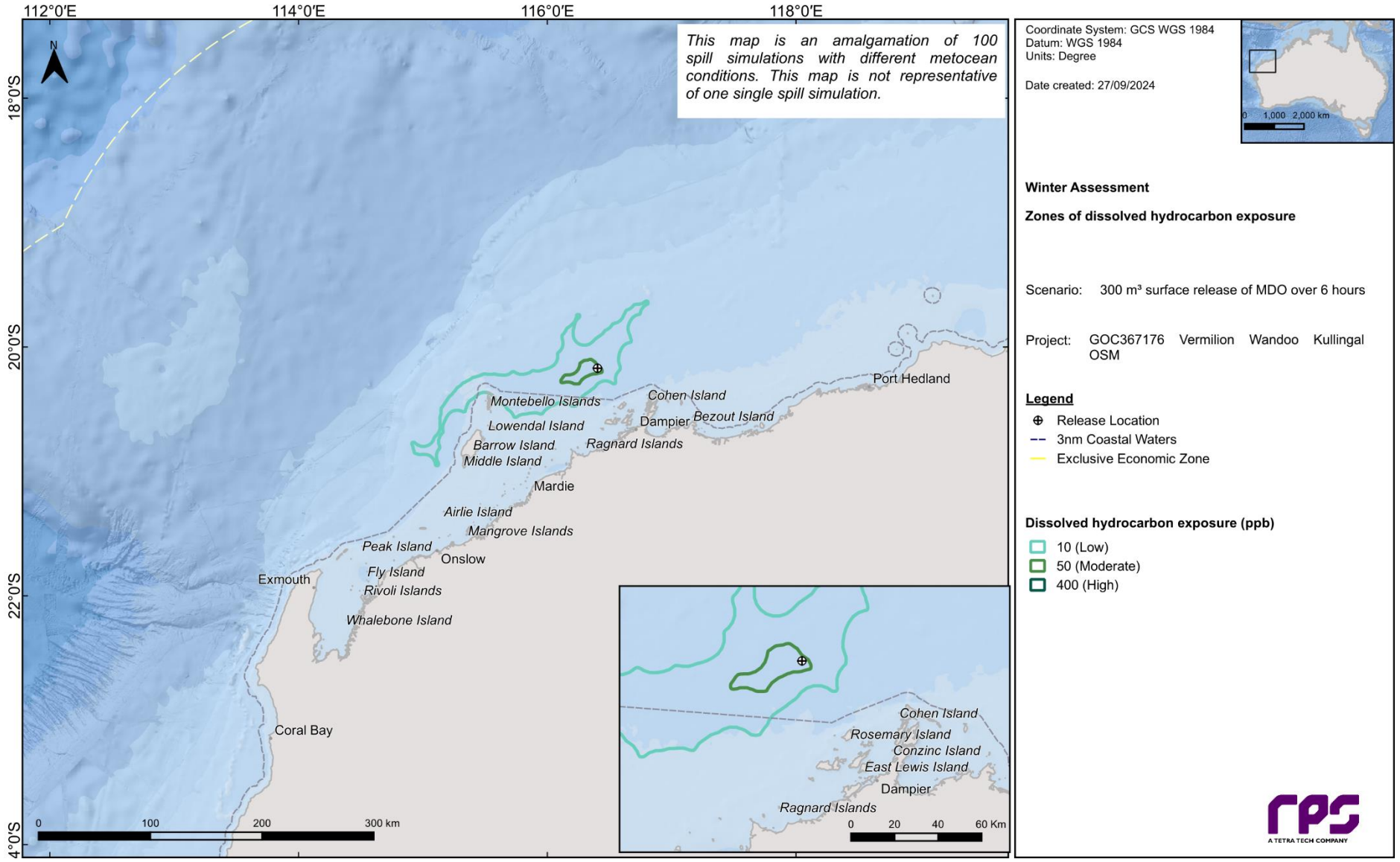

Figure 14.33 Predicted zones of dissolved hydrocarbon exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

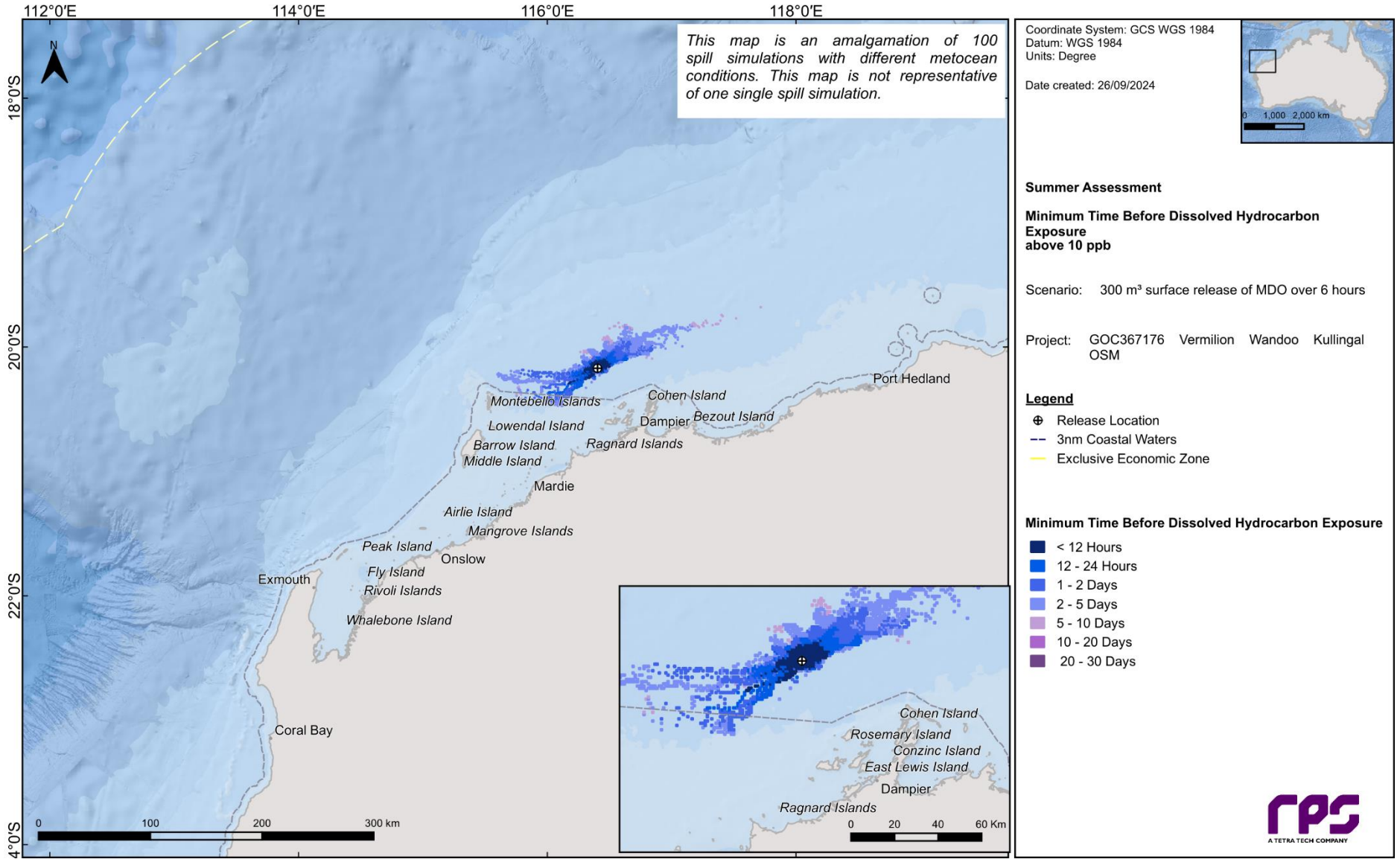

Figure 14.34 Minimum time before dissolved hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

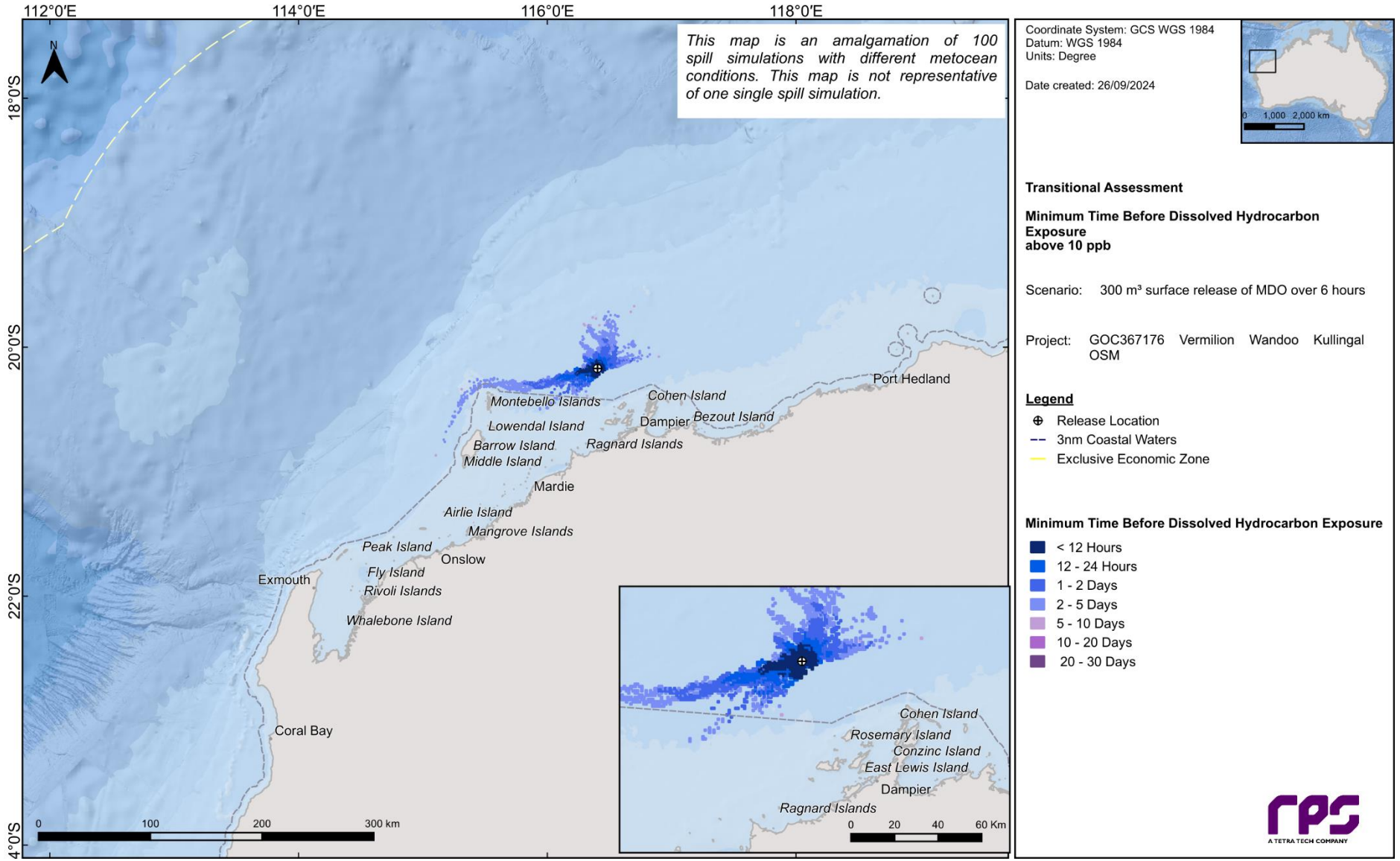

Figure 14.35 Minimum time before dissolved hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

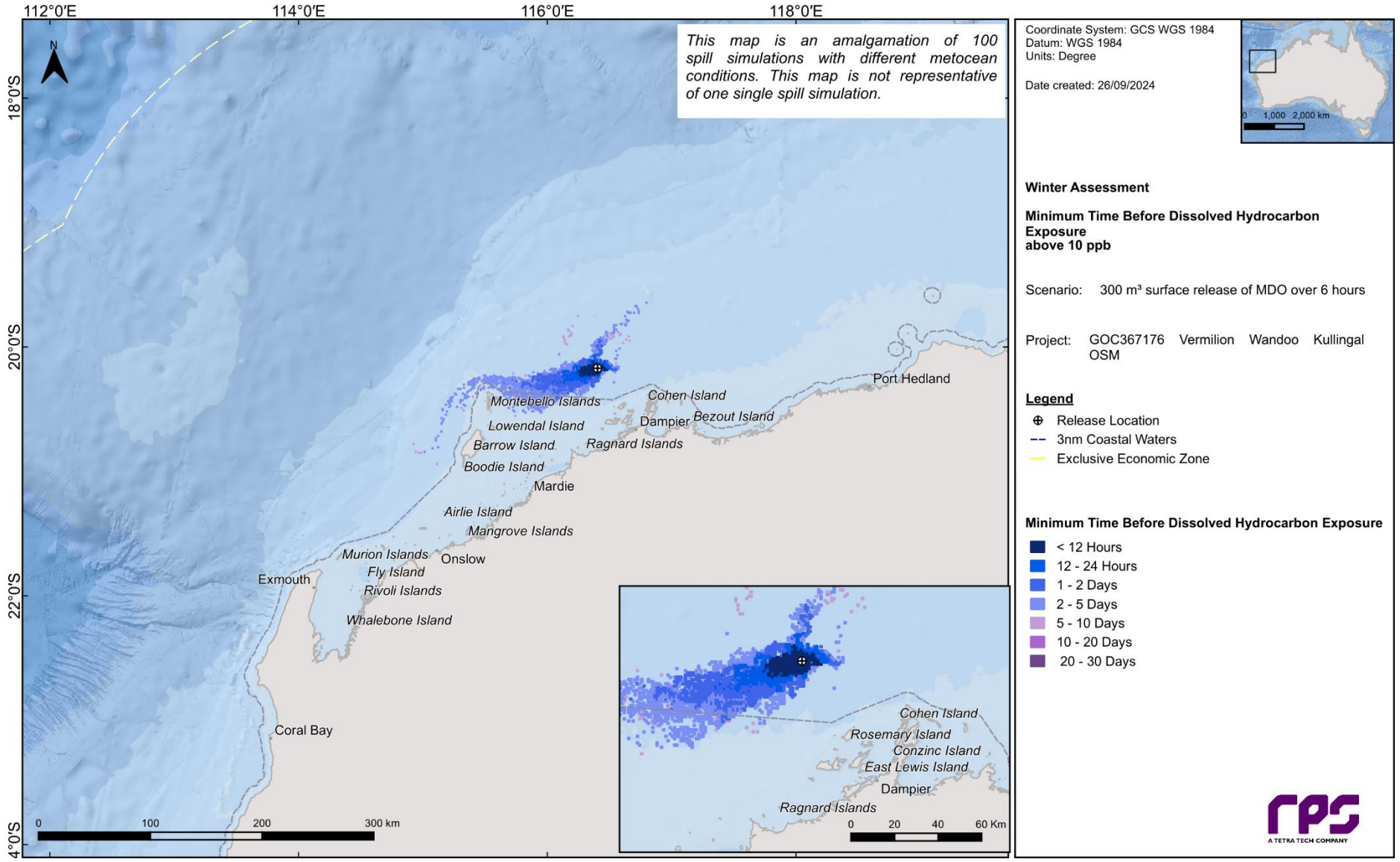

Figure 14.36 Minimum time before dissolved hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

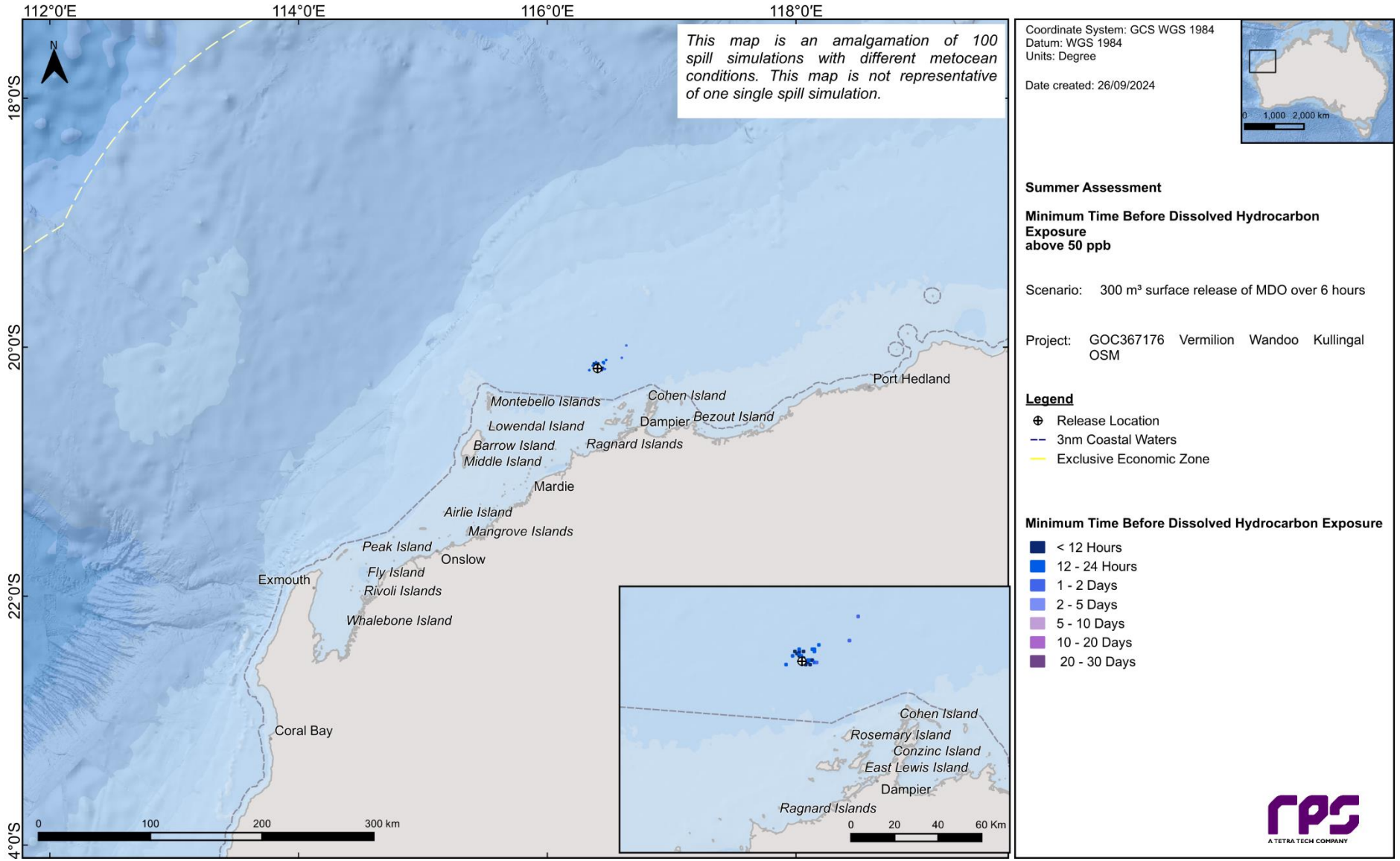

Figure 14.37 Minimum time before dissolved hydrocarbon exposure at, or above, 50 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

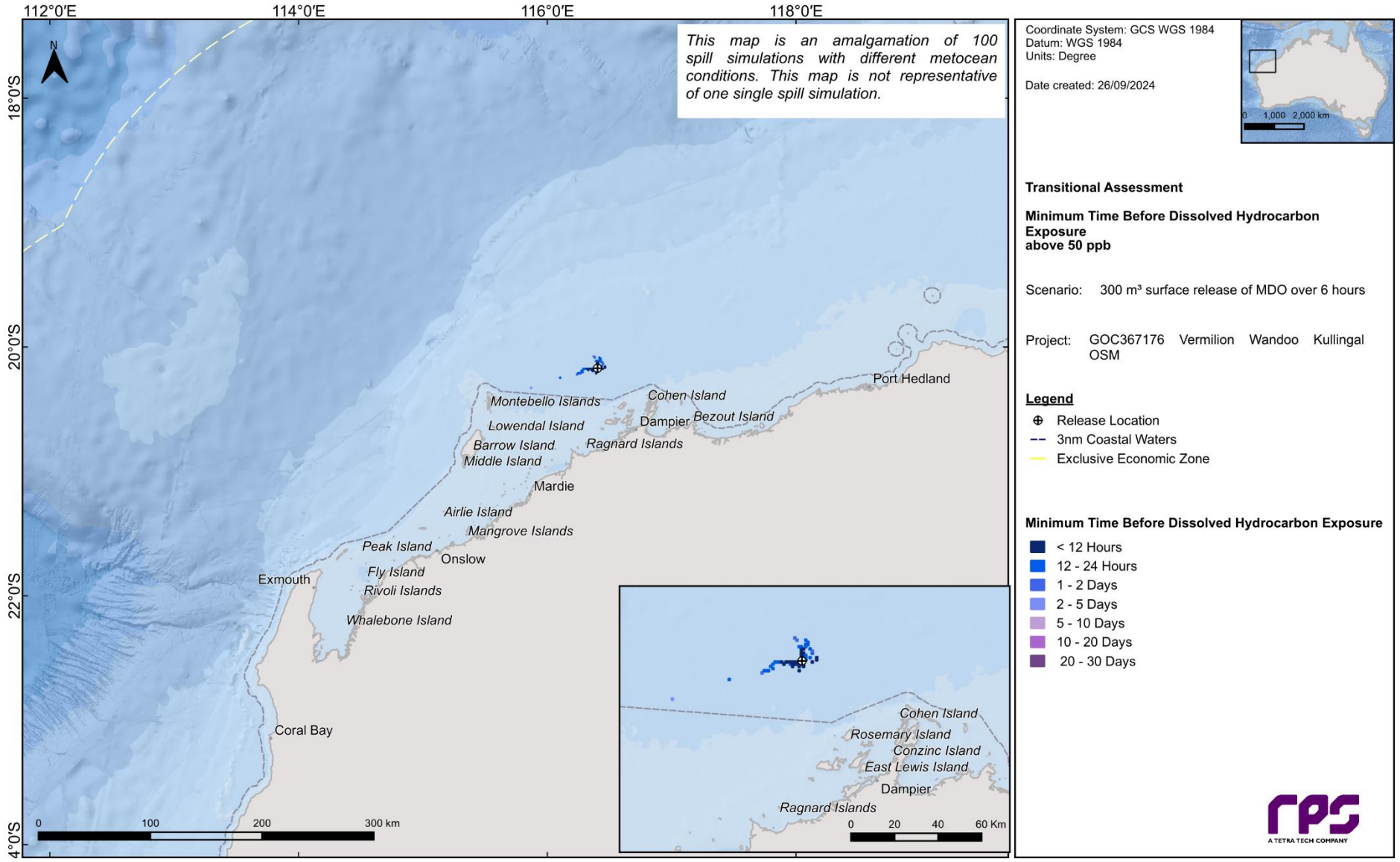

Figure 14.38 Minimum time before dissolved hydrocarbon exposure at, or above, 50 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

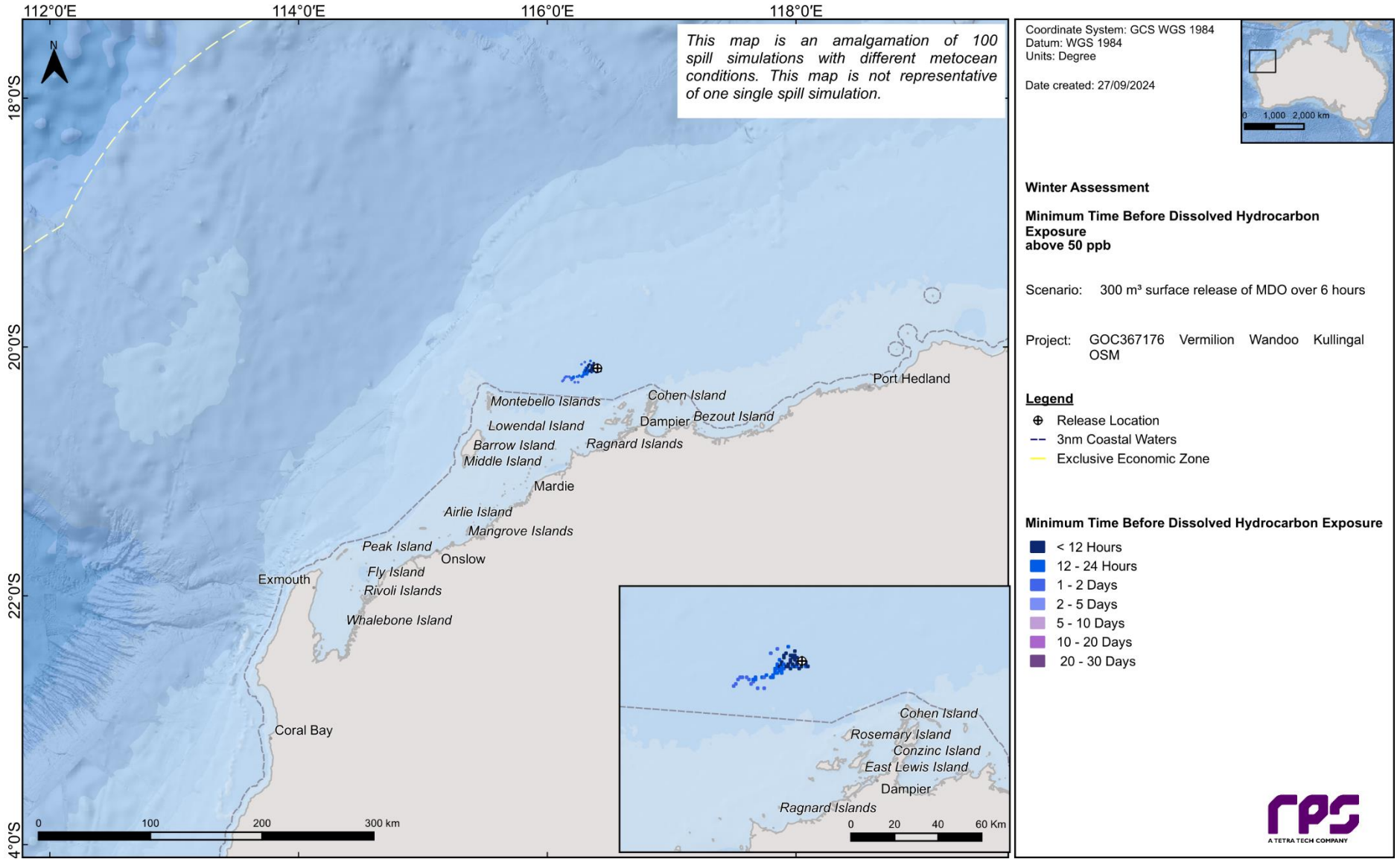

Figure 14.39 Minimum time before dissolved hydrocarbon exposure at, or above, 50 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

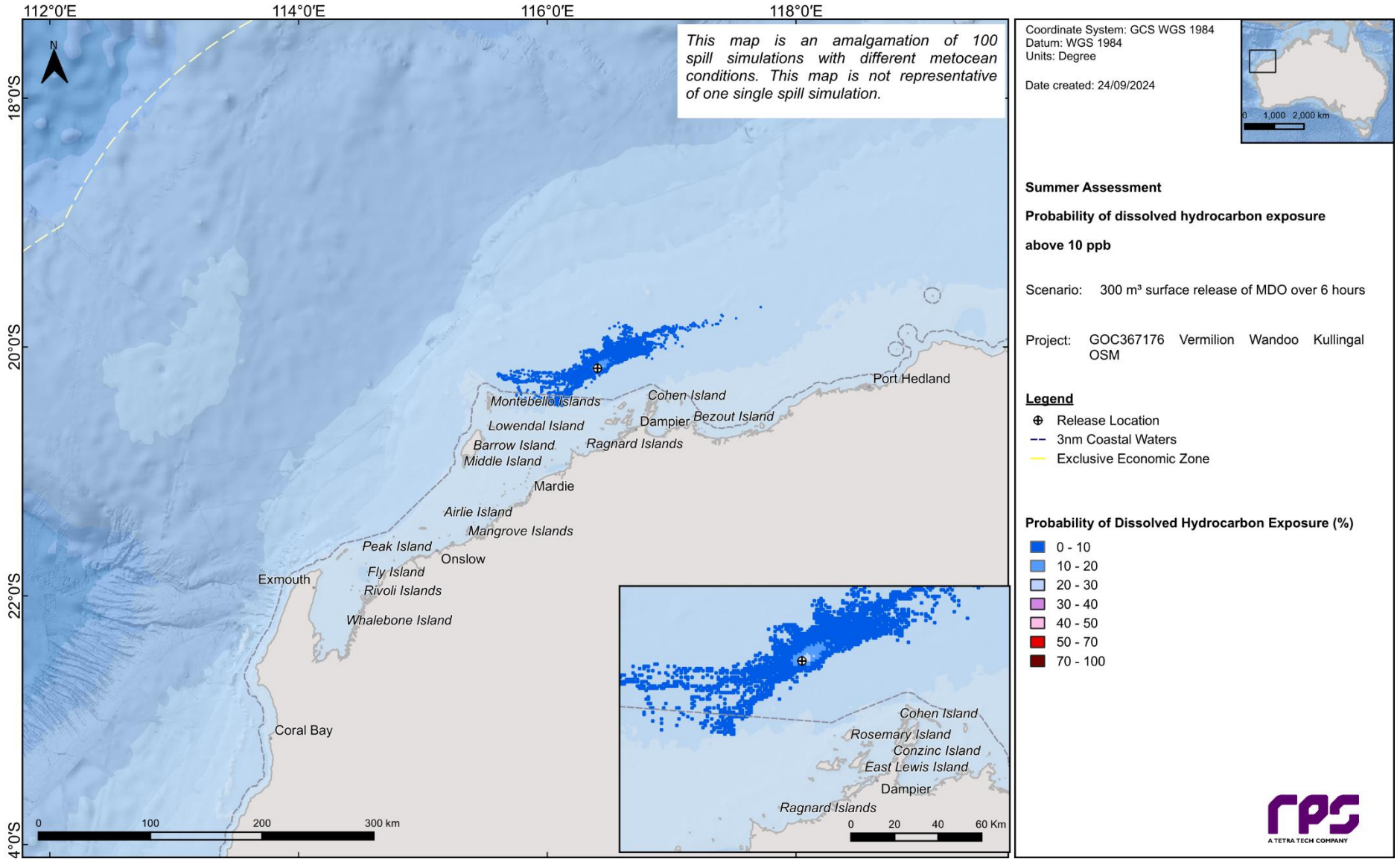

Figure 14.40 Probability of dissolved hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

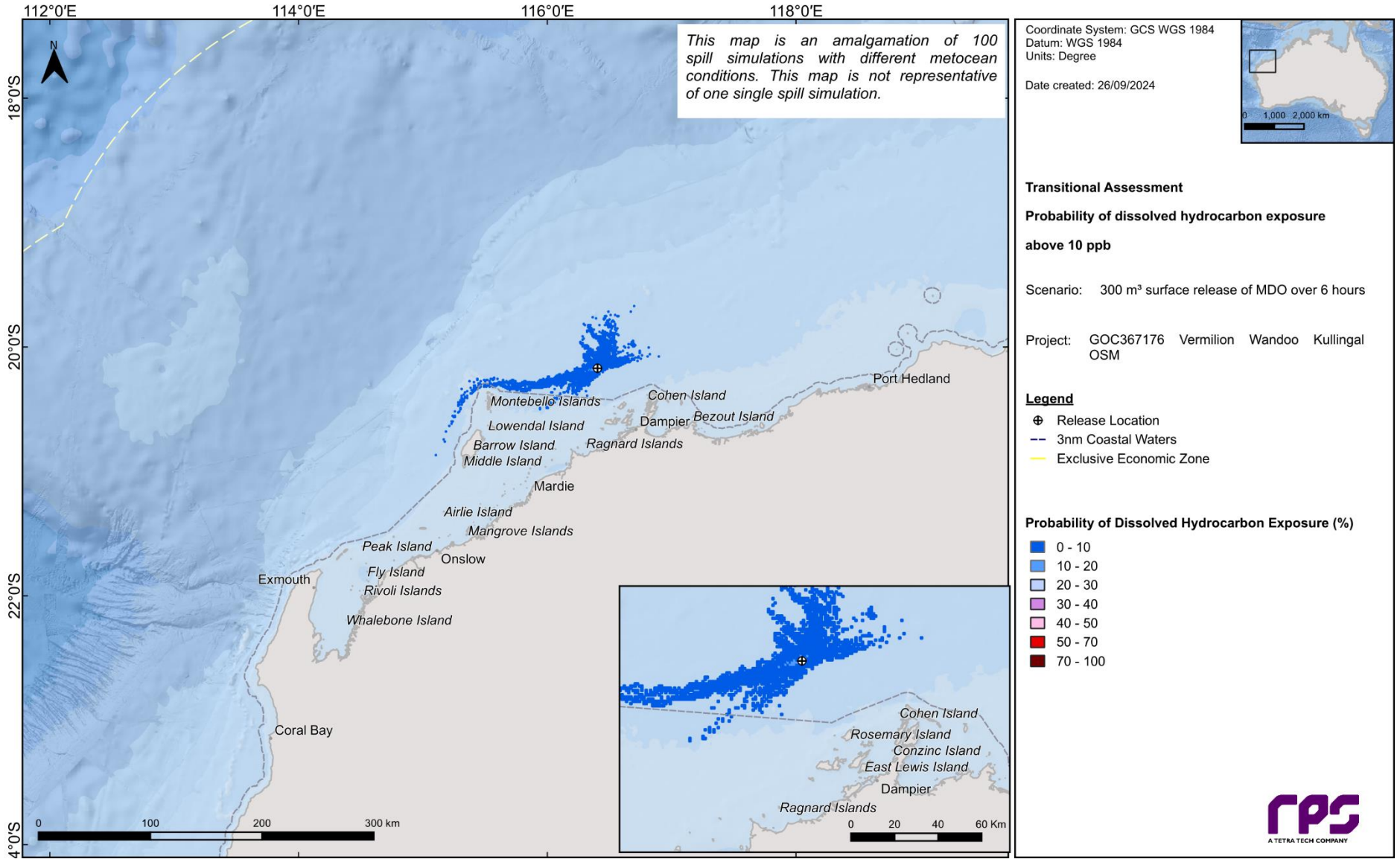

Figure 14.41 Probability of dissolved hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

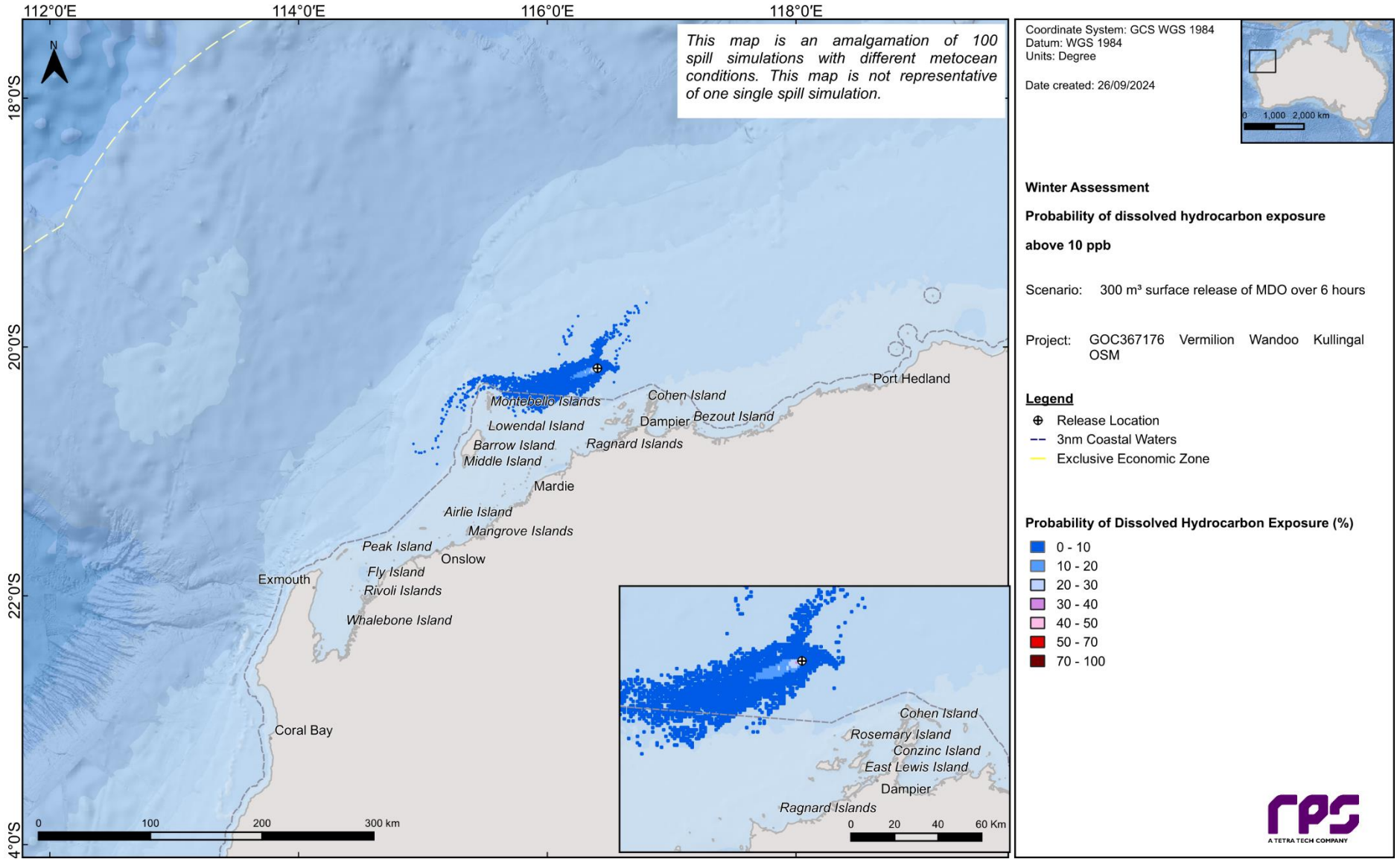

Figure 14.42 Probability of dissolved hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

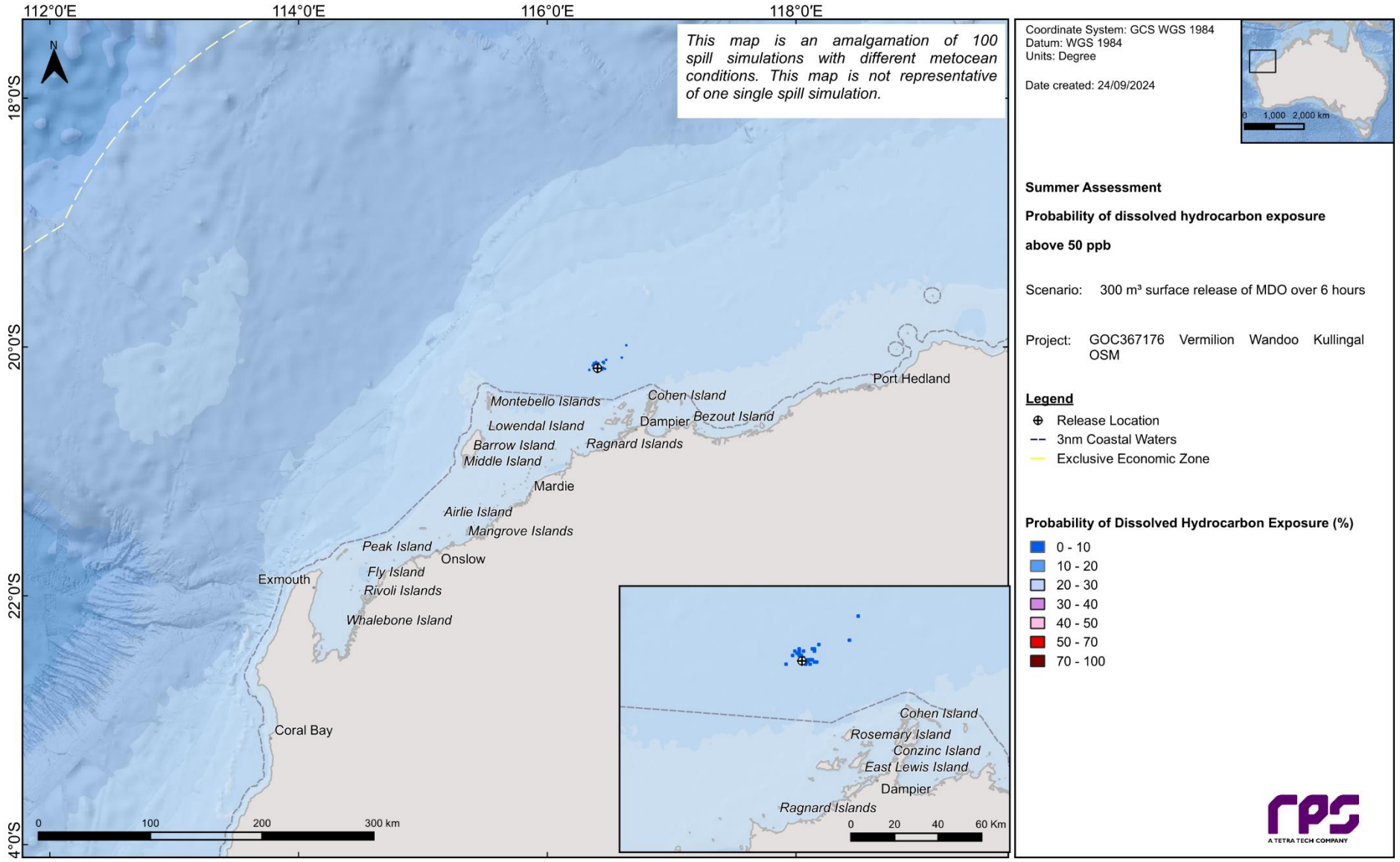

Figure 14.43 Probability of dissolved hydrocarbon exposure at, or above, 50 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

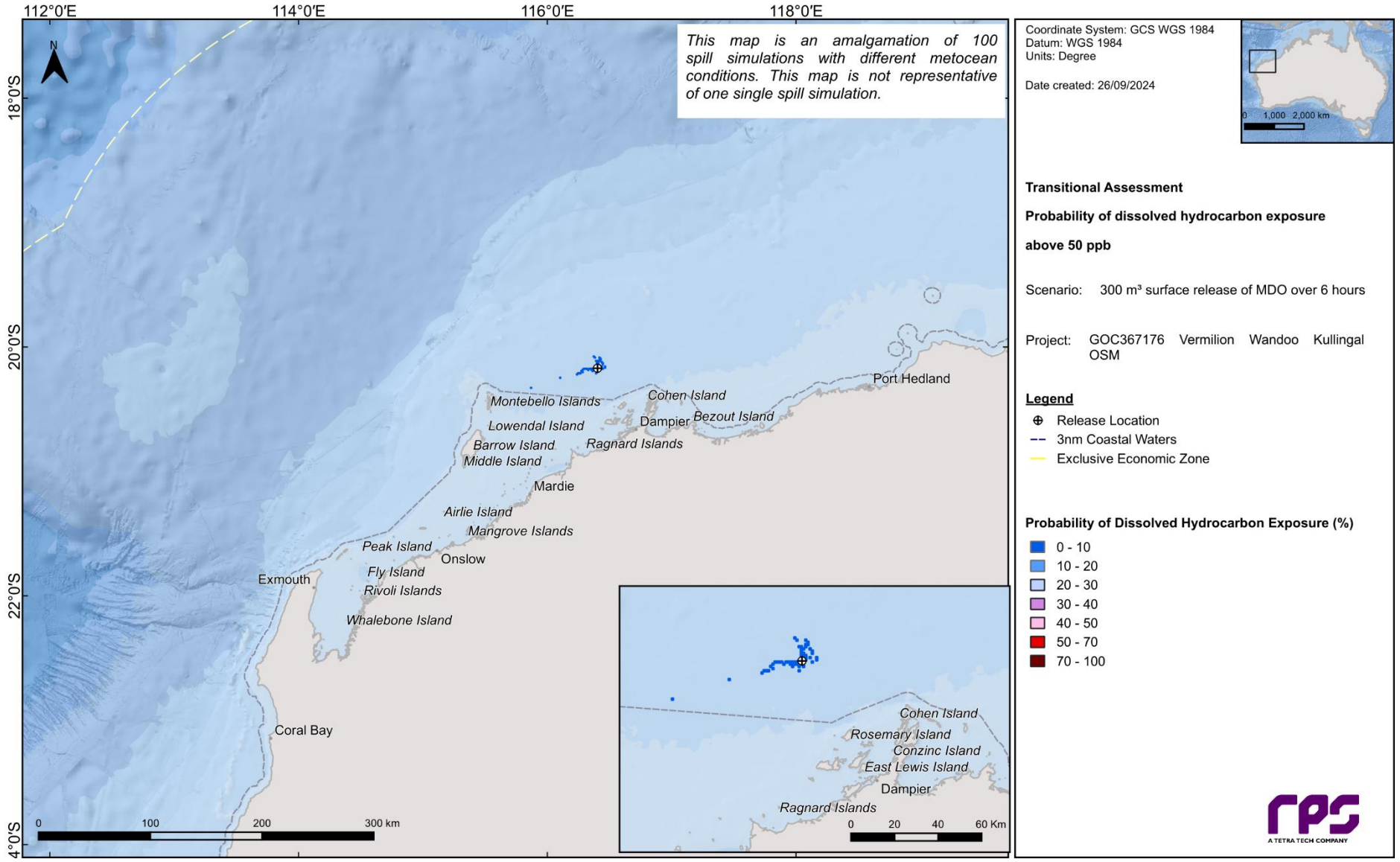

Figure 14.44 Probability of dissolved hydrocarbon exposure at, or above, 50 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

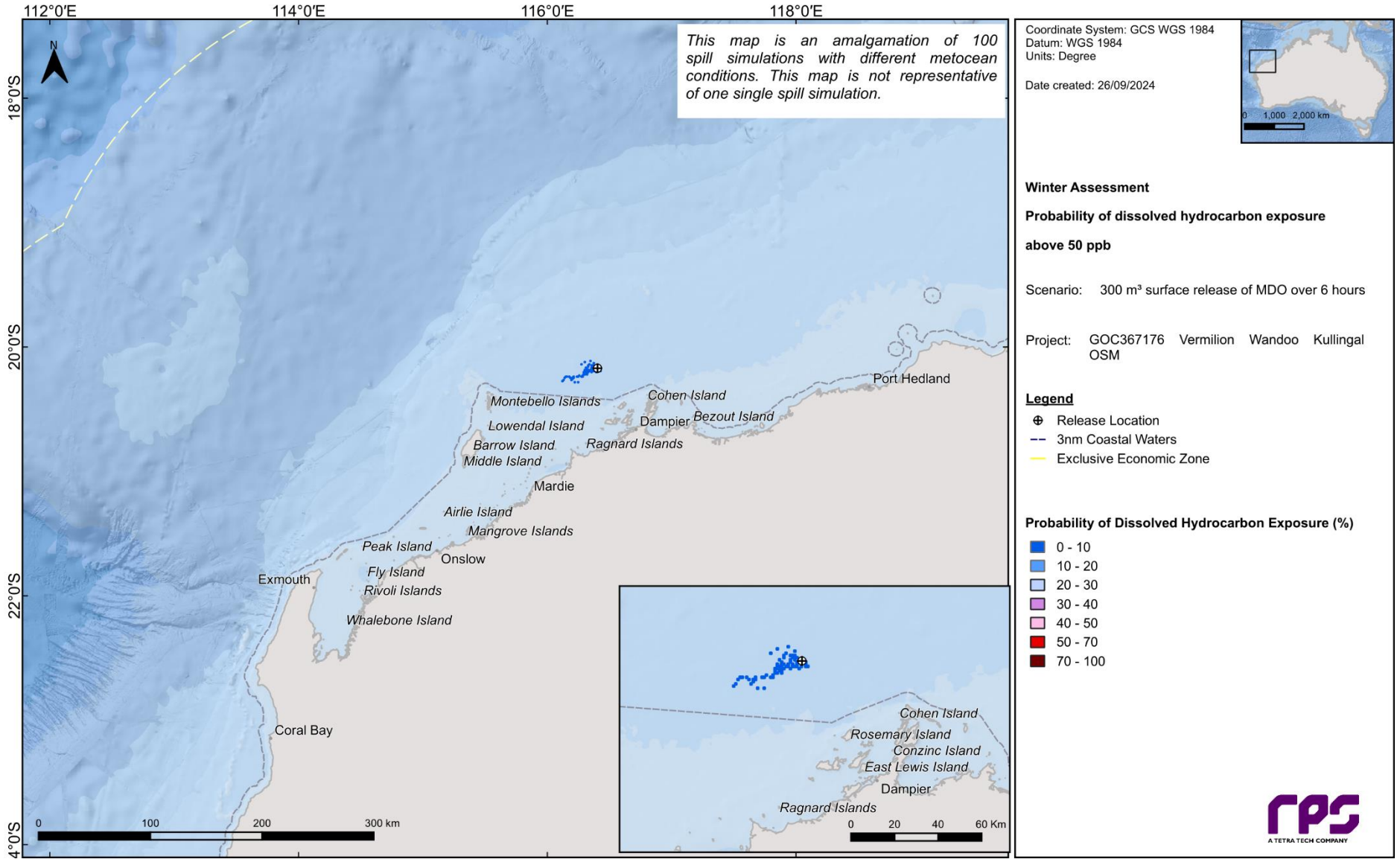

Figure 14.45 Probability of dissolved hydrocarbon exposure at, or above, 50 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

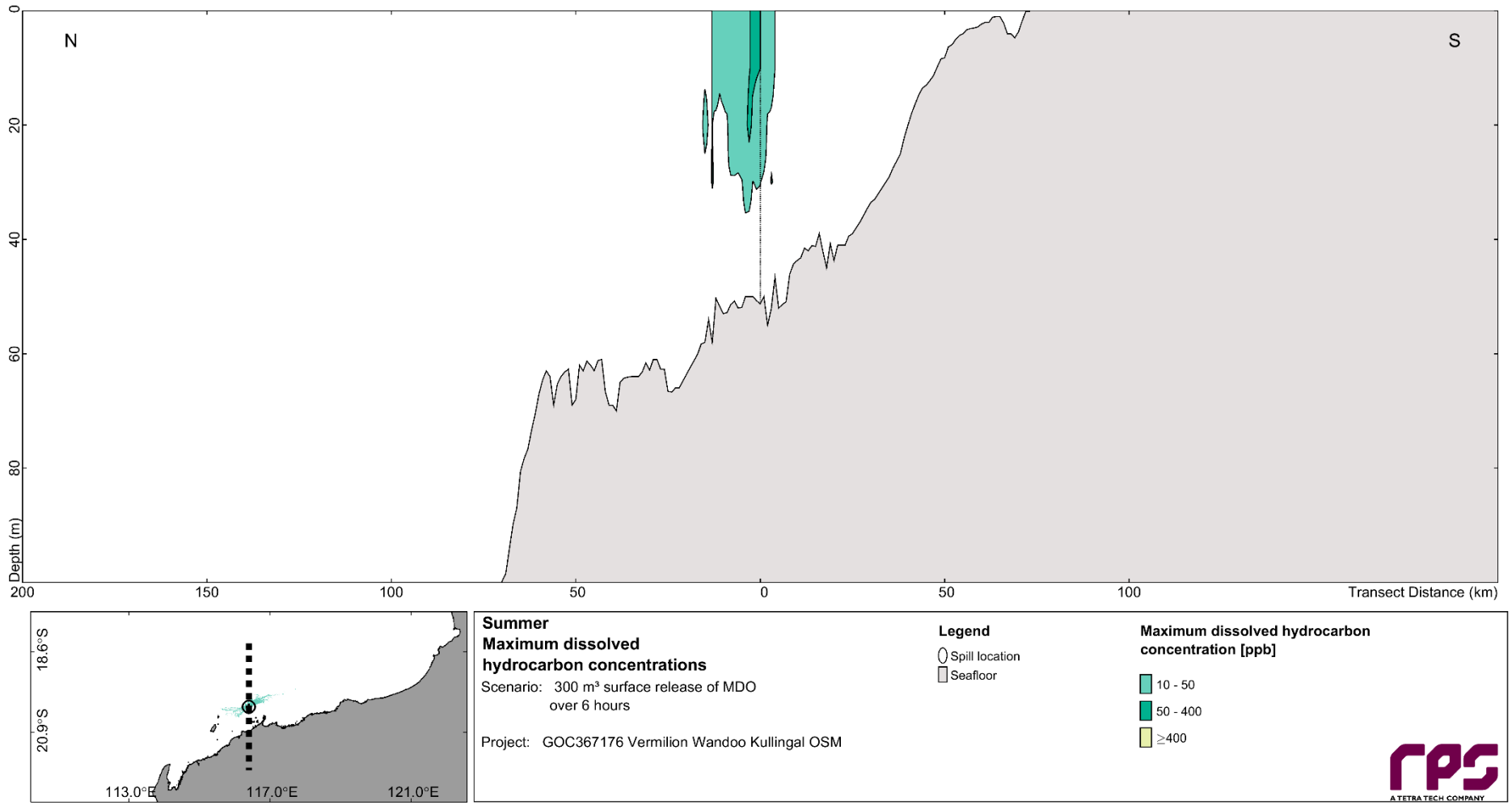

Figure 14.46 North-south cross-section transect of dissolved hydrocarbon concentrations exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

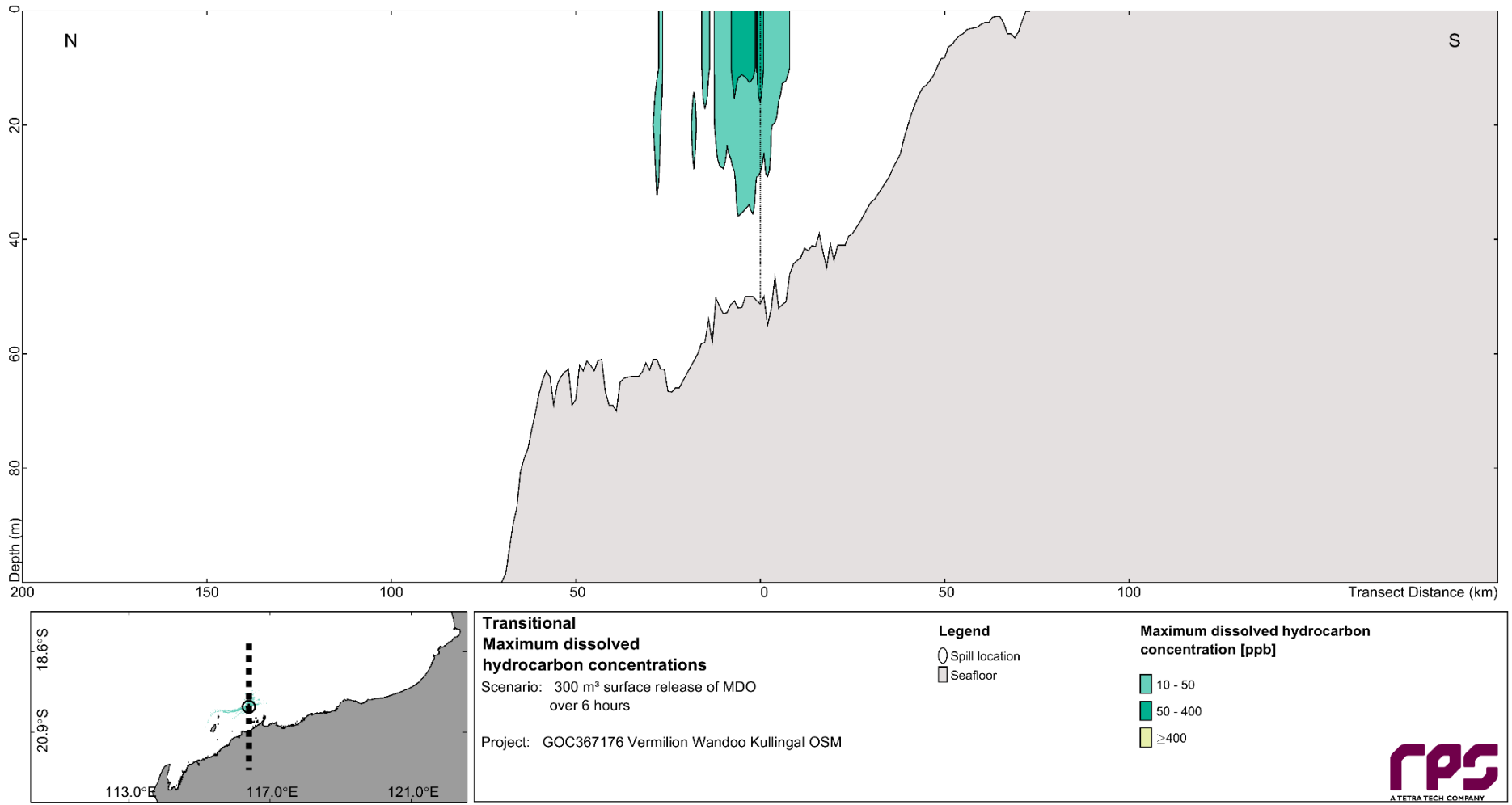

Figure 14.47 North-south cross-section transect of dissolved hydrocarbon concentrations exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

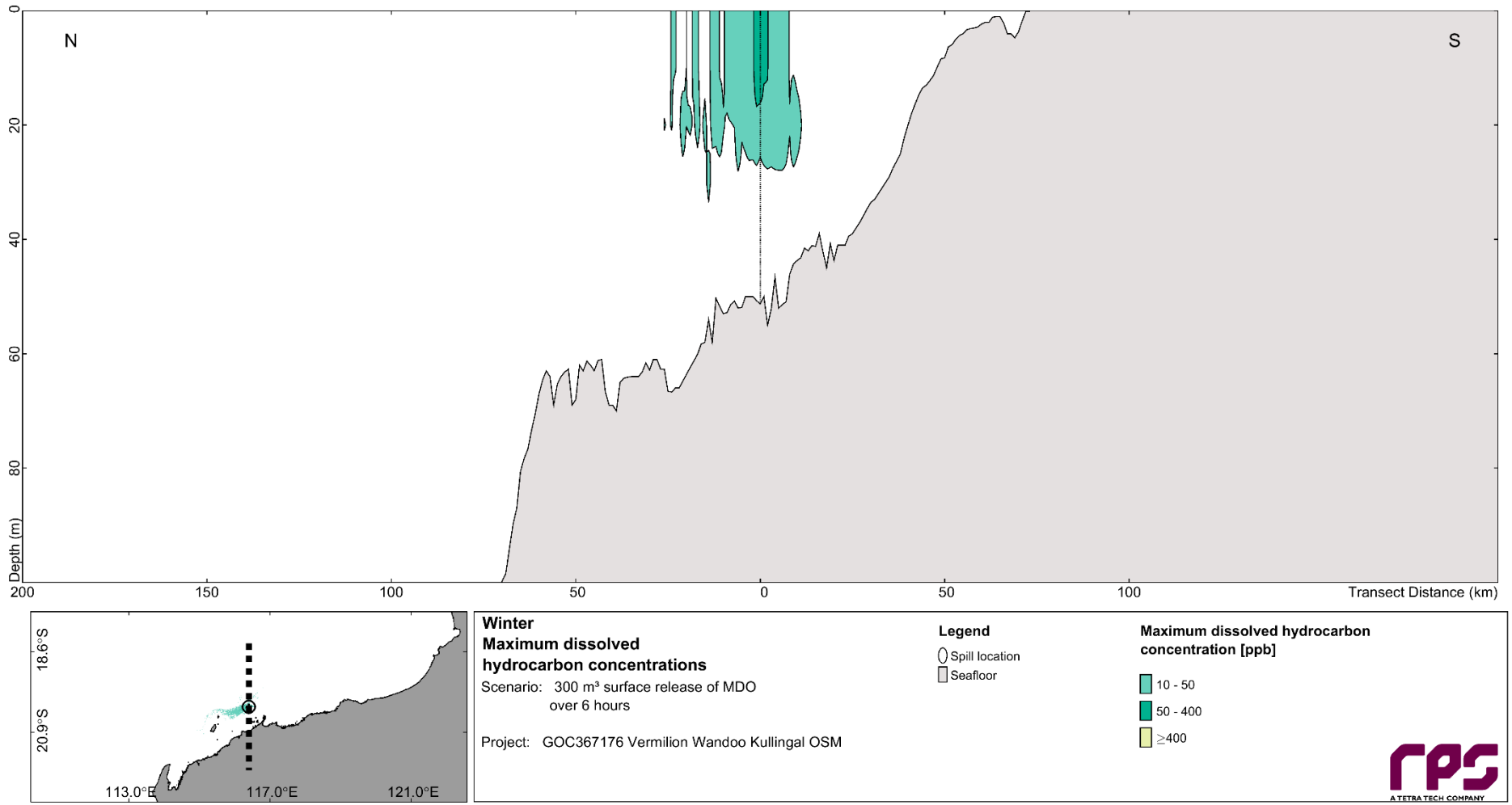

Figure 14.48 North-south cross-section transect of dissolved hydrocarbon concentrations exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

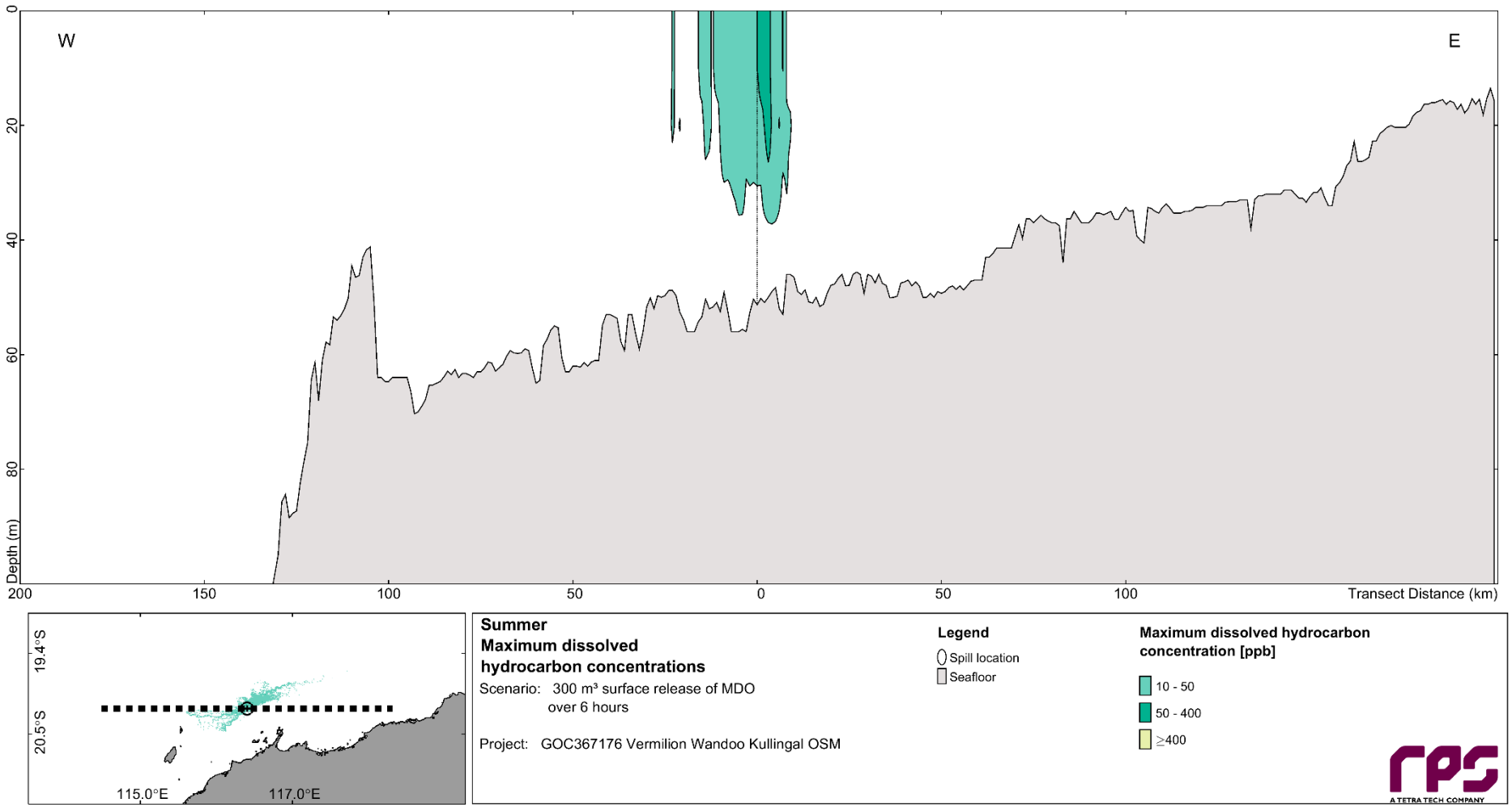

Figure 14.49 East-west cross-section transect of dissolved hydrocarbon concentrations exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

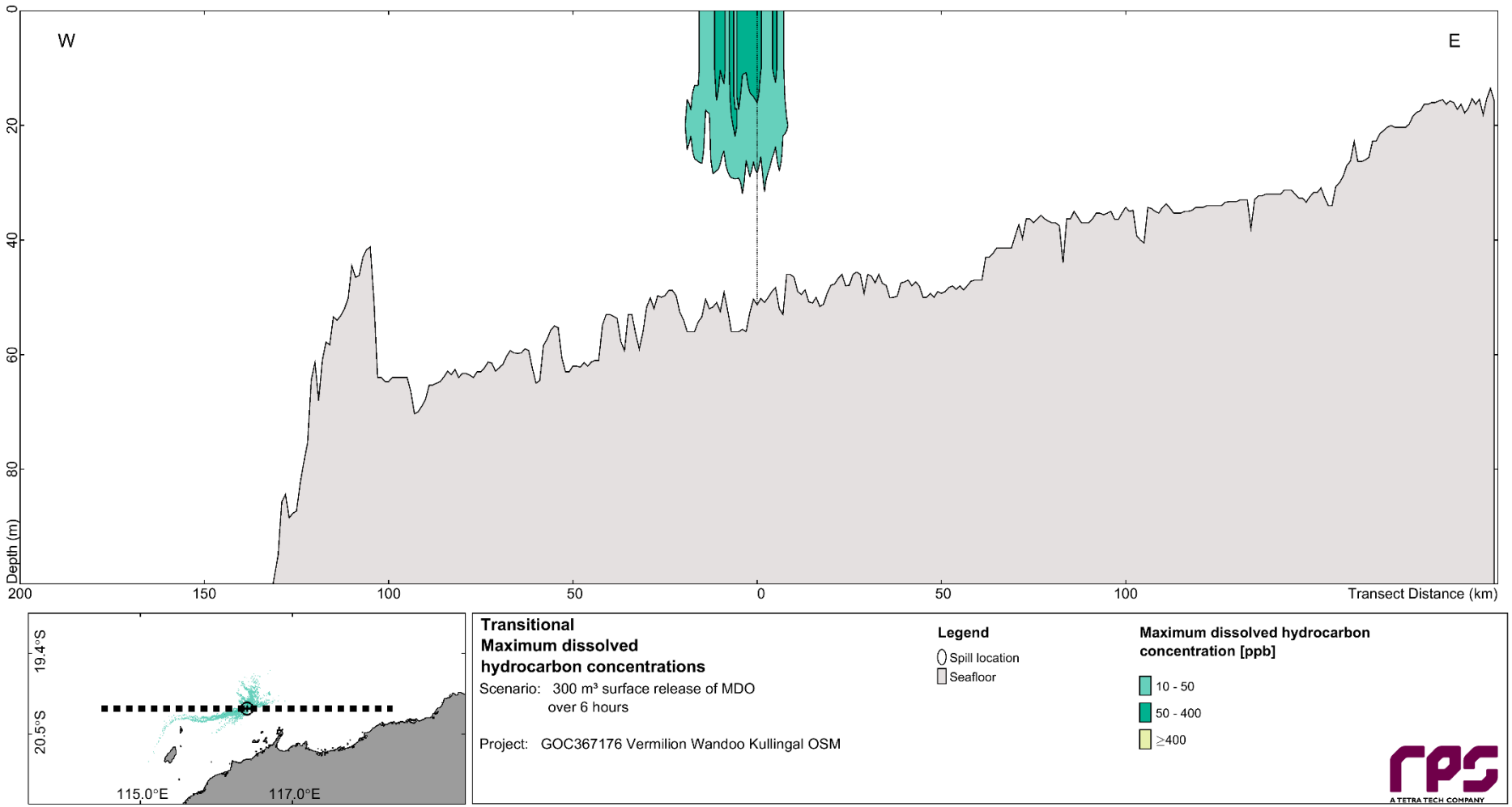

Figure 14.50 East-west cross-section transect of dissolved hydrocarbon concentrations exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

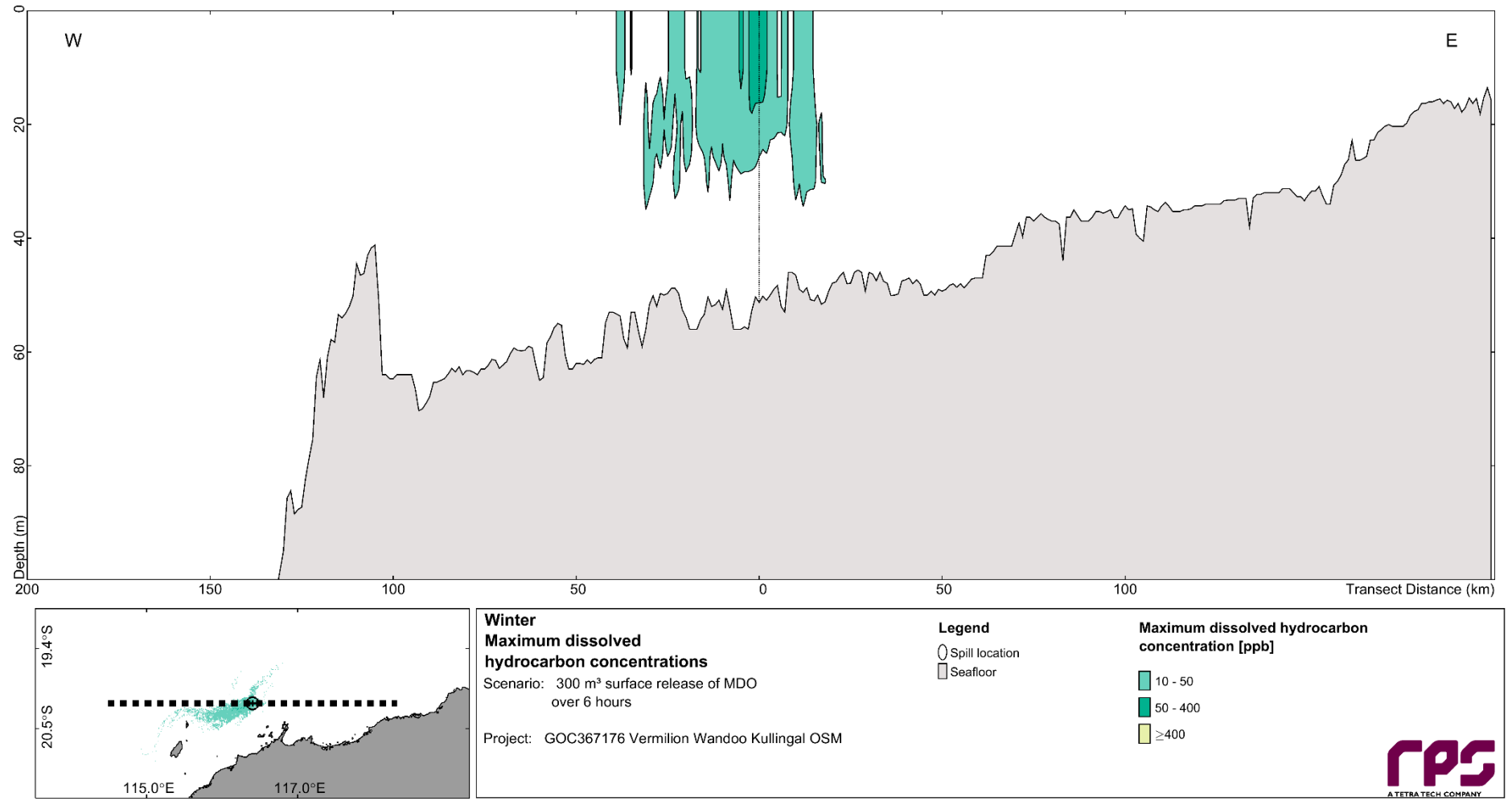

Figure 14.51 East-west cross-section transect of dissolved hydrocarbon concentrations exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

14.1.4.2 Entrained Hydrocarbons

Table 14.8 summarises the maximum distances from the release location to entrained hydrocarbon thresholds for each season. Concentrations exceeding 10 ppb may potentially extend up to 494 km from the release location. As the threshold increases to 100 ppb, the maximum distance decreases to 237 km.

Table 14.9 summarises the receptors exposed to entrained hydrocarbons per season (either at, or above, receptors in the water column).

The Montebello AMP recorded the highest probability of exposure to concentrations at, or above, 10 ppb, during all seasonal conditions, specifically 23%, 51% and 54% during summer, transitional and winter conditions, respectively. The same receptor registered the quickest time to exposure during summer and winter conditions at 22 hours.

Figure 14.52 to Figure 14.54 illustrate the zones of exposure to entrained hydrocarbons for each season, whilst Figure 14.55 to Figure 14.66 display the minimum exposure times and the probability of exposure to these hydrocarbons.

Seasonal cross-sectional transects (north-south and east-west) of the maximum entrained hydrocarbons in the vicinity of the release site, are presented in Figure 14.67 to Figure 14.72.

Table 14.8 Maximum distances from the release location to entrained hydrocarbon exposure thresholds following a vessel collision at Kullingal. Results were calculated from 100 spill simulations per season.

Season	Distance and direction travelled	Entrained hydrocarbon exposure thresholds	
		10 ppb	100 ppb
Summer	Maximum distance (km) from release location	315	101
	Direction	Northeast	East
Transitional	Maximum distance (km) from release location	424	132
	Direction	Southwest	West
Winter	Maximum distance (km) from release location	494	237
	Direction	Southwest	Southwest

Table 14.9 Receptors predicted to be exposed by entrained hydrocarbons following a vessel collision at Kullingal. Results were calculated from100 spill simulations per season.

Category	Name	Summer						Transitional						Winter					
		Probability (%) of entrained hydrocarbon concentration		Minimum time to receptor waters (hours) at		Maximum entrained hydrocarbon concentration (ppb)		Probability (%) of entrained hydrocarbon concentration		Minimum time to receptor waters (hours) at		Maximum entrained hydrocarbon concentration (ppb)		Probability (%) of entrained hydrocarbon concentration		Minimum time to receptor waters (hours) at		Maximum entrained hydrocarbon concentration (ppb)	
		≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb	averaged over all replicate spills	in the worst replicate	≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb	averaged over all replicate spills	in the worst replicate	≥ 10 ppb	≥ 100 ppb	≥ 10 ppb	≥ 100 ppb	averaged over all replicate spills	in the worst replicate
AMP	Dampier	NC	NC	NC	NC	NC	NC	1	NC	268	NC	<1	27	NC	NC	NC	NC	NC	NC
	Gascoyne	NC	NC	NC	NC	NC	NC	4	NC	349	NC	2	23	13	NC	238	NC	4	46
	Montebello	23	3	22	23	12	307	51	22	25	26	57	430	54	24	22	24	62	560
KEF	Ancient coastline at 125 m depth contour	4	NC	153	NC	2	46	8	NC	197	NC	3	41	17	1	115	289	6	117
	Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	NC	NC	NC	NC	NC	NC	7	NC	262	NC	2	33	16	NC	174	NC	6	90
	Commonwealth waters adjacent to Ningaloo Reef	NC	NC	NC	NC	NC	NC	5	NC	352	NC	2	42	13	NC	226	NC	4	53

	Continental Slope Demersal Fish Communities	3	NC	284	NC	<1	18	6	NC	269	NC	2	35	11	NC	157	NC	4	57
	Exmouth Plateau	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2	NC	371	NC	<1	23
	Glomar Shoals	10	NC	87	NC	4	64	12	1	99	110	5	115	5	3	70	75	7	231
MP	Barrow Island	1	NC	251	NC	<1	21	6	NC	121	NC	2	43	13	1	86	183	6	104
	Montebello Islands	5	1	132	150	3	113	24	2	59	66	11	166	37	7	57	67	23	316
	Ningaloo	NC	NC	NC	NC	NC	NC	5	NC	352	NC	2	42	13	NC	226	NC	4	53
NR	Great Sandy Island	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	452	NC	<1	12
	Lowendal Islands	1	NC	298	NC	<1	22	2	NC	138	NC	<1	60	7	NC	161	NC	3	86
RSB	Barrow Island Reefs and Shoals	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	406	NC	<1	23
	Combe Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	366	NC	<1	15
	Dailey Shoal	NC	NC	NC	NC	NC	NC	3	NC	297	NC	<1	13	5	NC	210	NC	2	29
	Glomar Shoal	5	NC	228	NC	2	30	4	NC	141	NC	2	79	2	NC	117	NC	<1	68
	Hammersley Shoal	NC	NC	NC	NC	NC	NC	1	NC	314	NC	<1	18	NC	NC	NC	NC	NC	NC
	Madeleine Shoals	NC	NC	NC	NC	NC	NC	1	NC	267	NC	<1	27	NC	NC	NC	NC	NC	NC
	Montebello Shoals	3	NC	139	NC	<1	37	12	NC	141	NC	4	49	22	NC	81	NC	9	69
	Ningaloo Reef	NC	NC	NC	NC	NC	NC	2	NC	395	NC	<1	23	2	NC	512	NC	<1	22
	Otway Reef	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	2	NC	301	NC	<1	15

	Outtrim Patches	1	NC	474	NC	<1	12	4	NC	292	NC	2	25	10	NC	209	NC	3	31
	Penguin Bank	1	NC	217	NC	<1	25	4	NC	170	NC	2	21	6	NC	156	NC	4	64
	Poivre Reef	NC	NC	NC	NC	NC	NC	2	NC	141	NC	<1	18	7	NC	139	NC	3	79
	Rankin Bank	NC	NC	NC	NC	NC	NC	2	NC	310	NC	<1	22	3	NC	393	NC	2	32
	Ripple Shoals	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	1	NC	459	NC	<1	13
	Rosily Shoals	1	NC	229	NC	<1	15	NC	NC	NC	NC	NC	NC	2	NC	169	NC	2	27
	Tryal Rocks	6	NC	180	NC	2	28	23	NC	76	NC	7	56	23	4	51	69	13	125
State and Territory Waters	WA	8	2	16	16	7	324	27	3	38	40	13	266	44	13	39	41	35	406

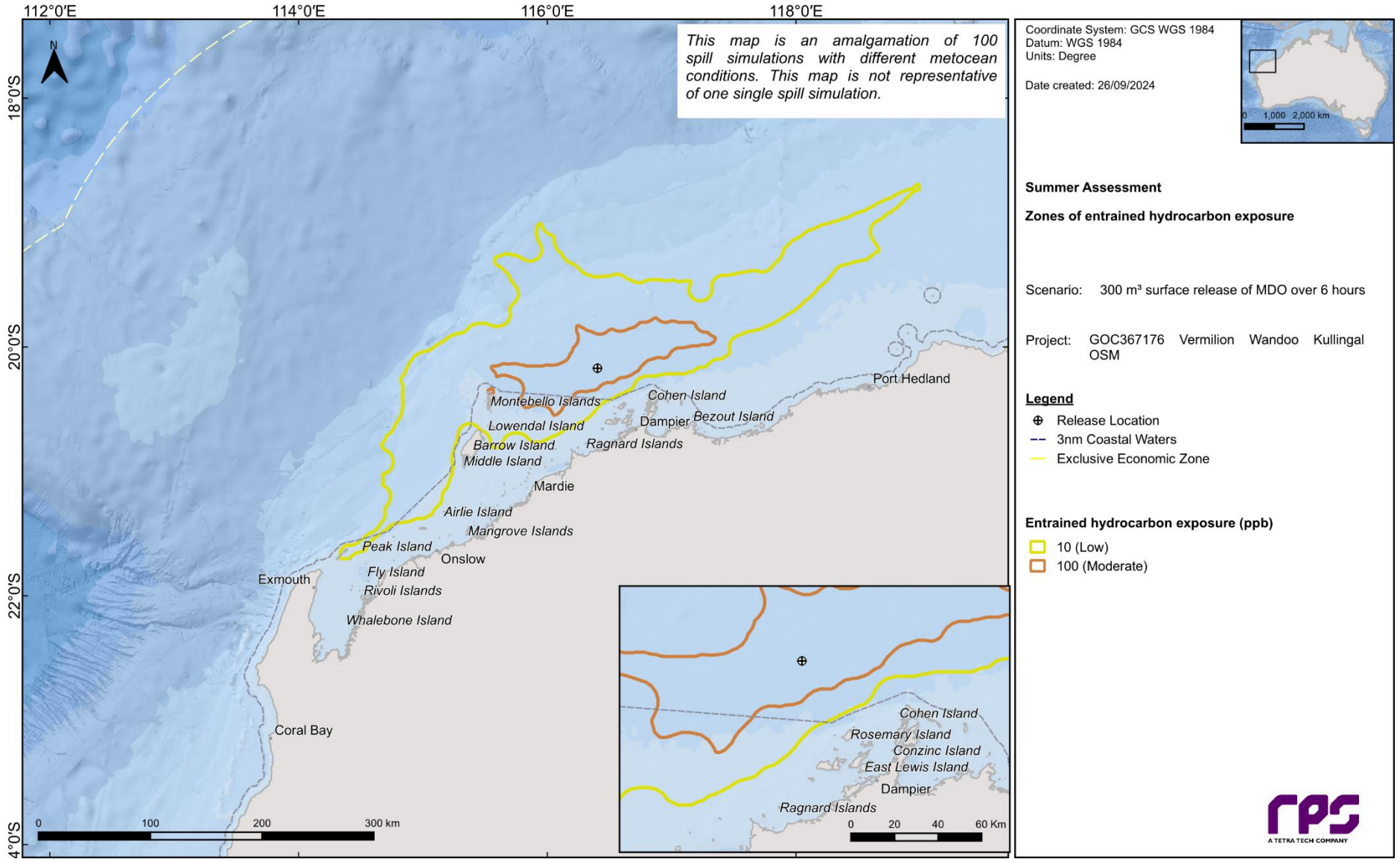

Figure 14.52 Predicted zones of entrained hydrocarbon exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

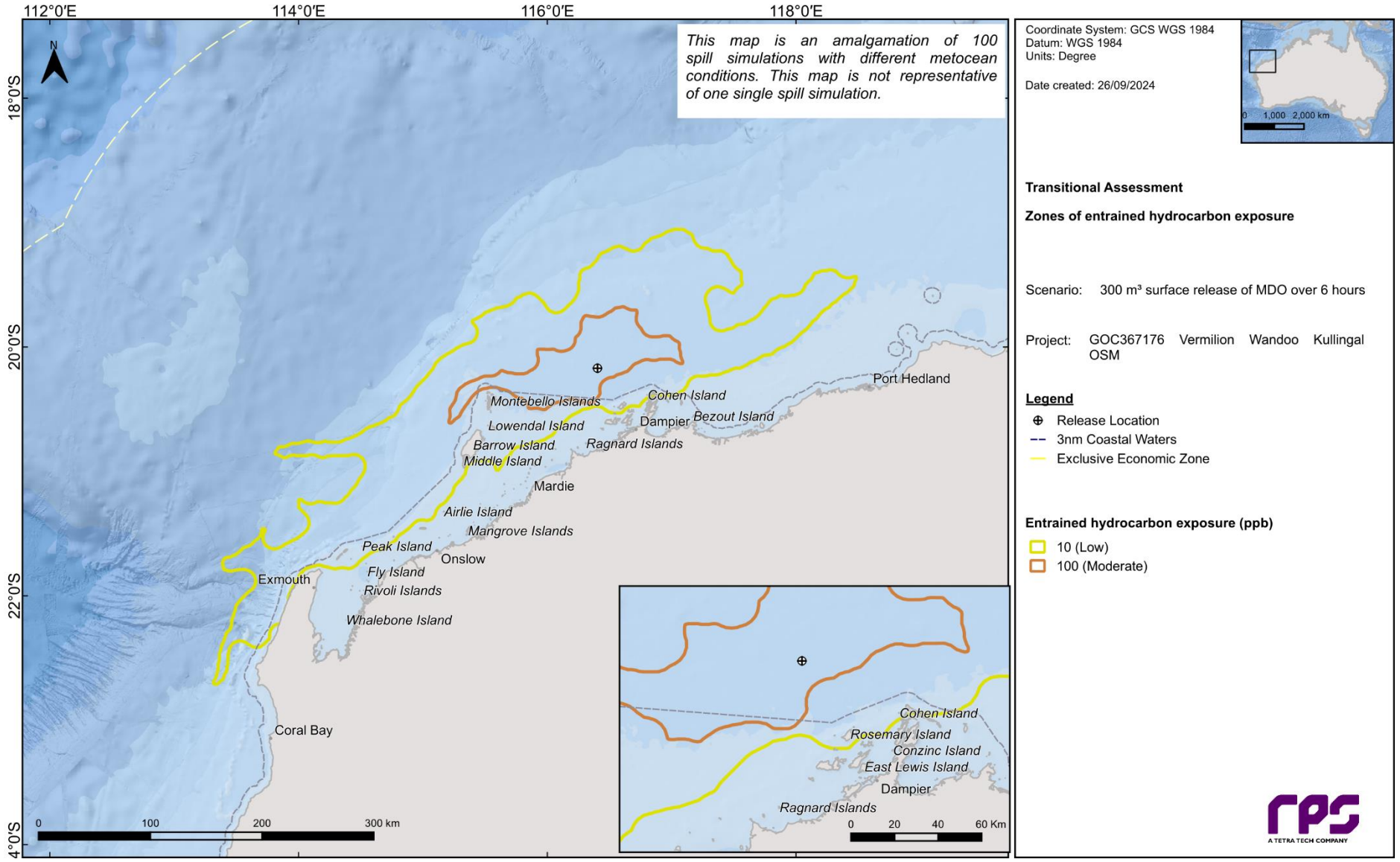

Figure 14.53 Predicted zones of entrained hydrocarbon exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

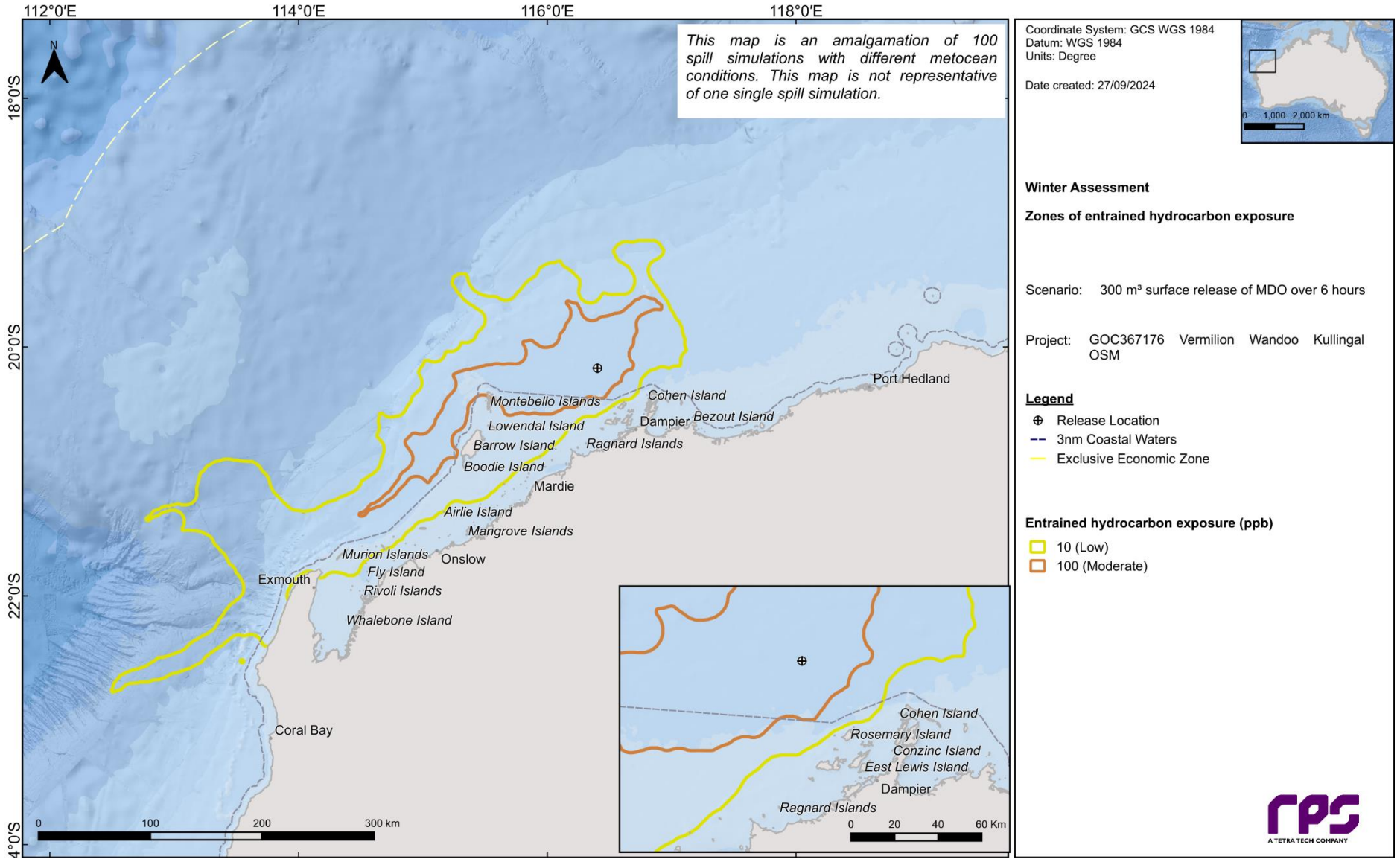

Figure 14.54 Predicted zones of entrained hydrocarbon exposure following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

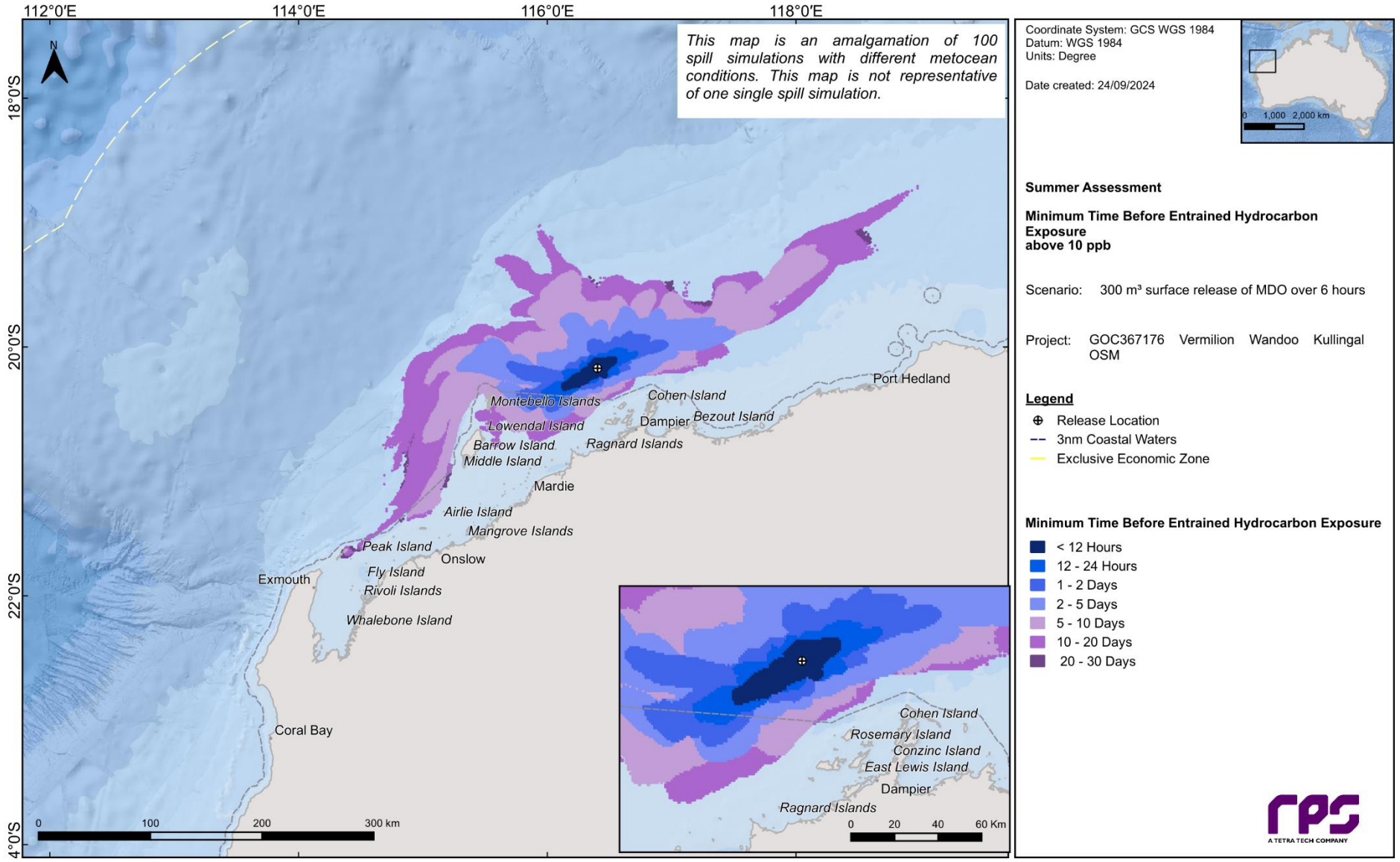

Figure 14.55 Minimum time before entrained hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

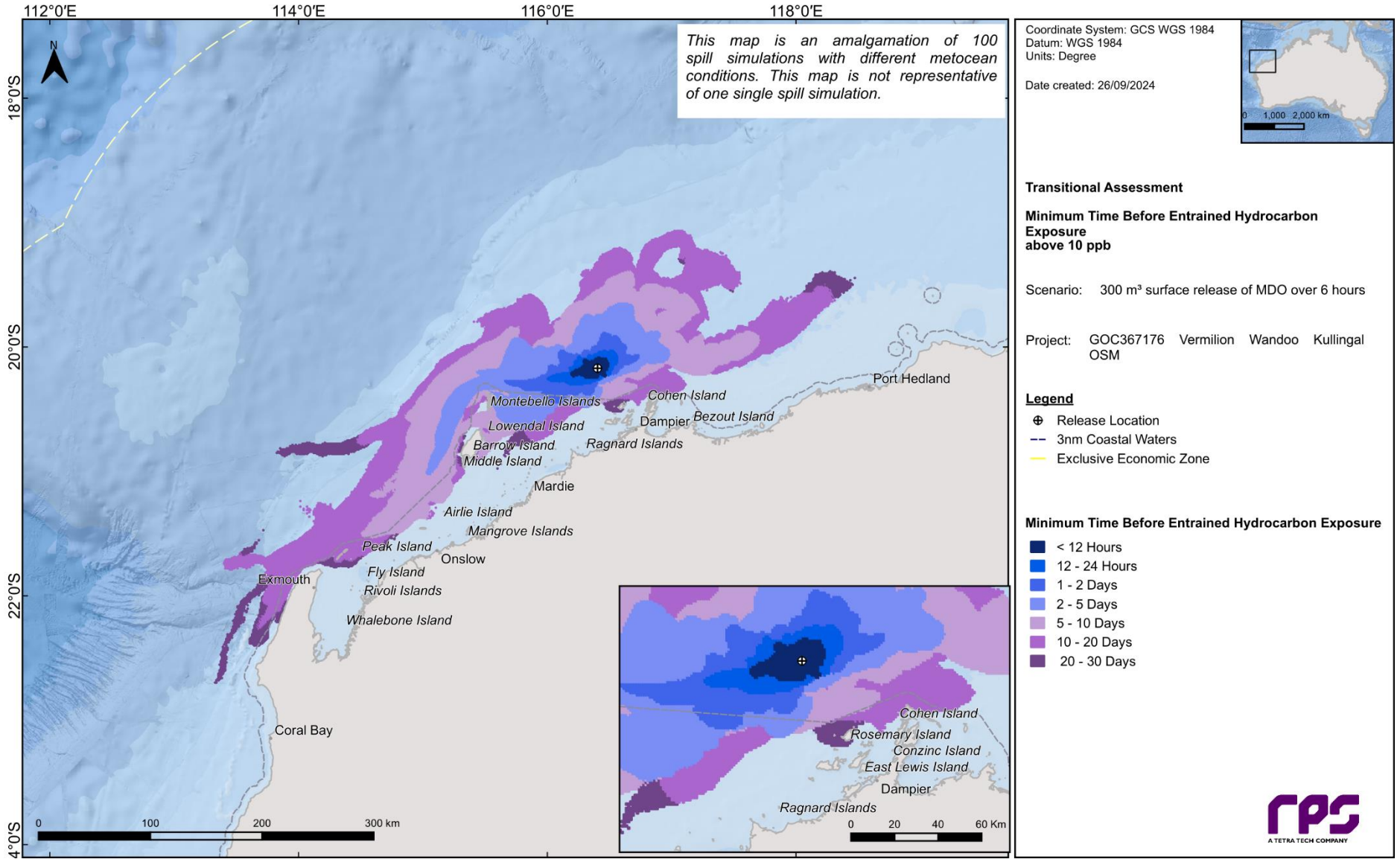

Figure 14.56 Minimum time before entrained hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

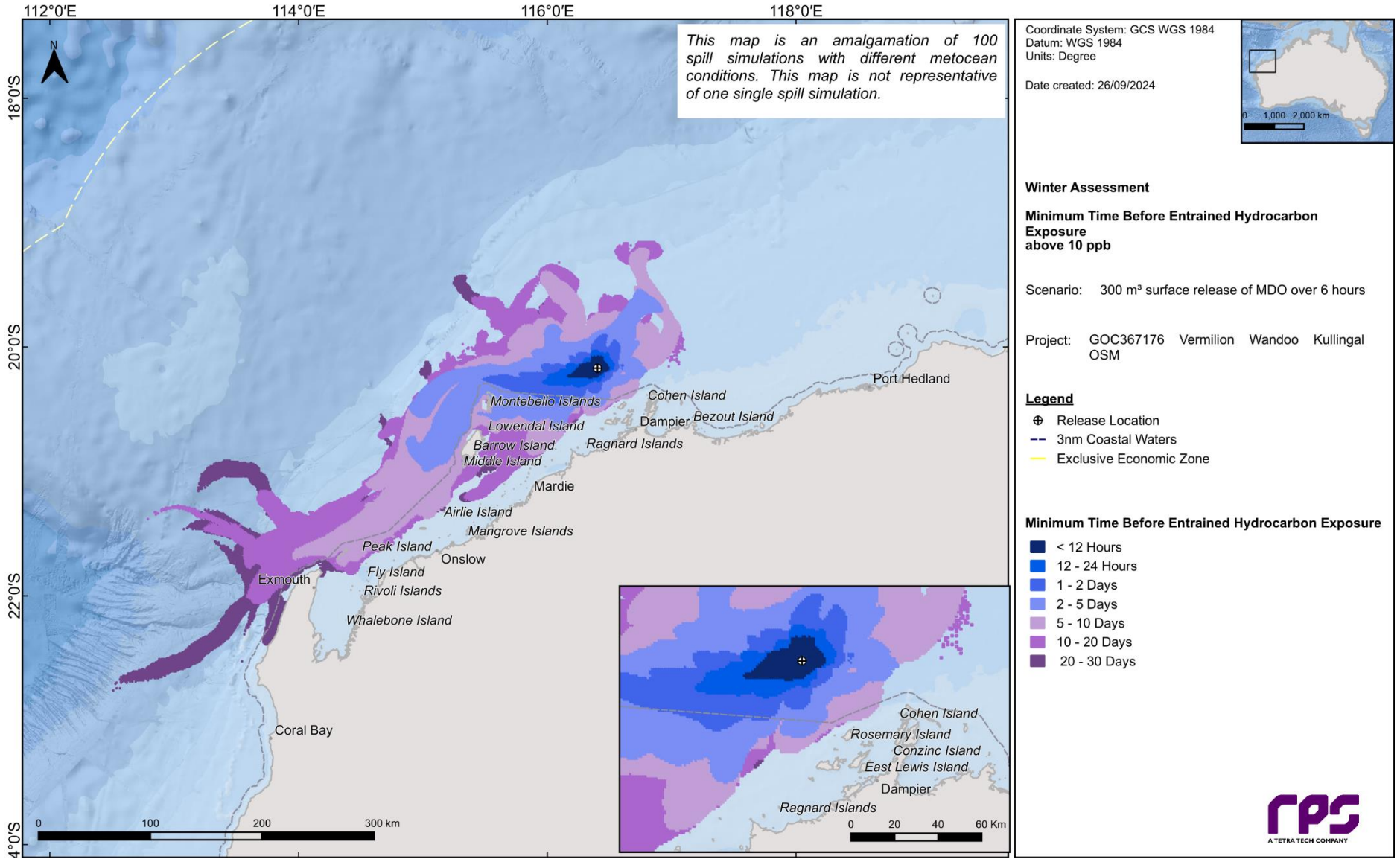

Figure 14.57 Minimum time before entrained hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

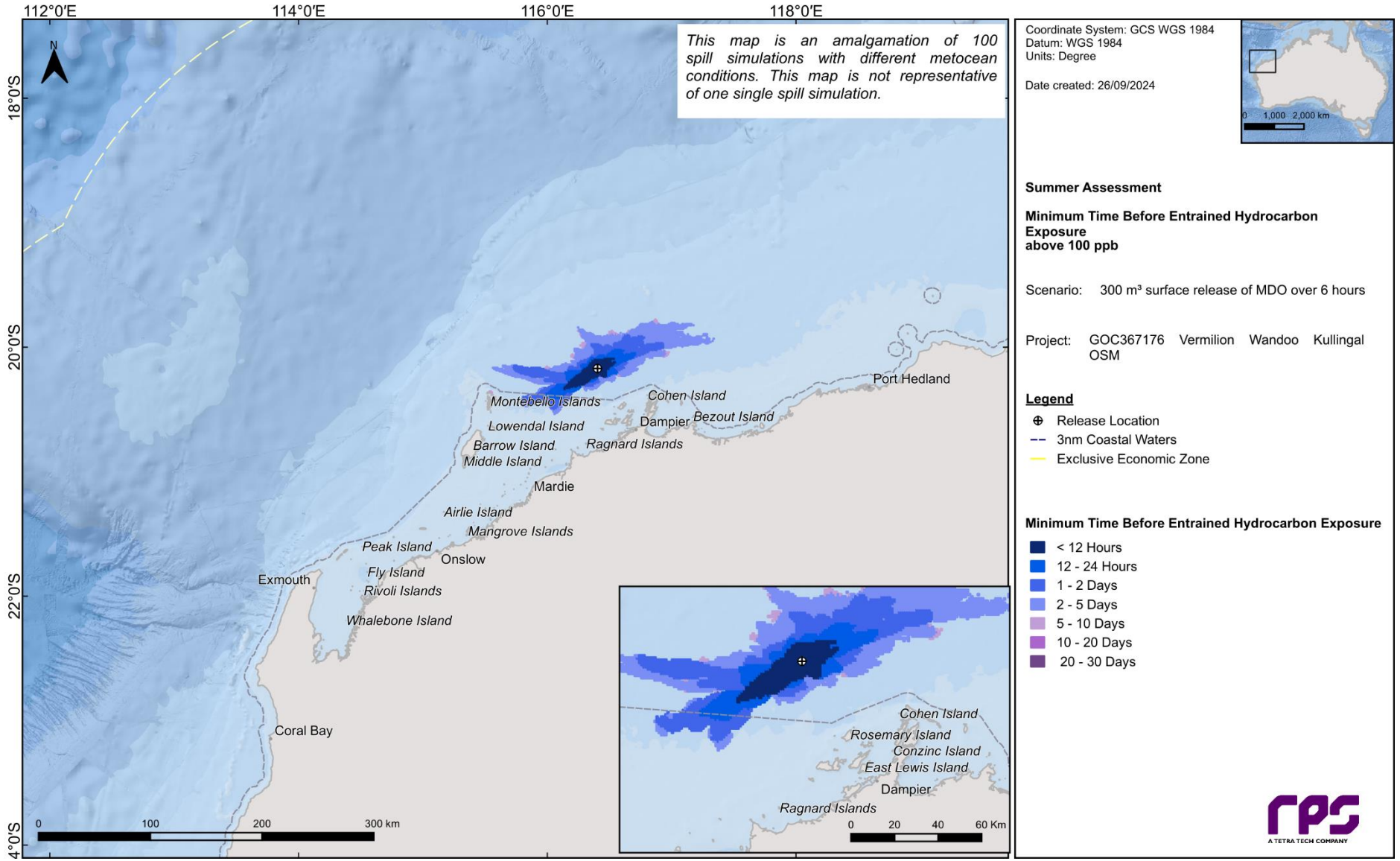

Figure 14.58 Minimum time before entrained hydrocarbon exposure at, or above, 100 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

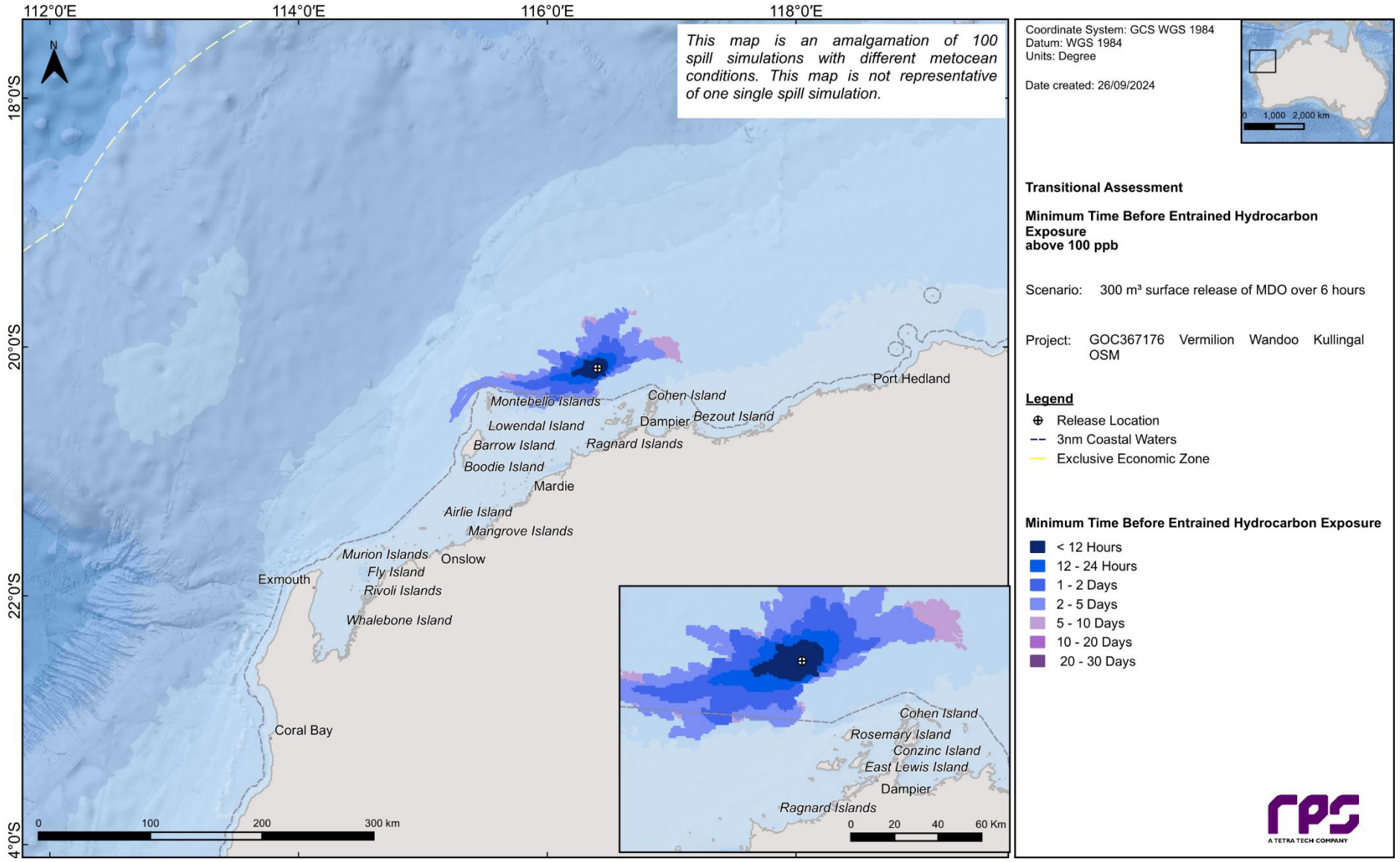

Figure 14.59 Minimum time before entrained hydrocarbon exposure at, or above, 100 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

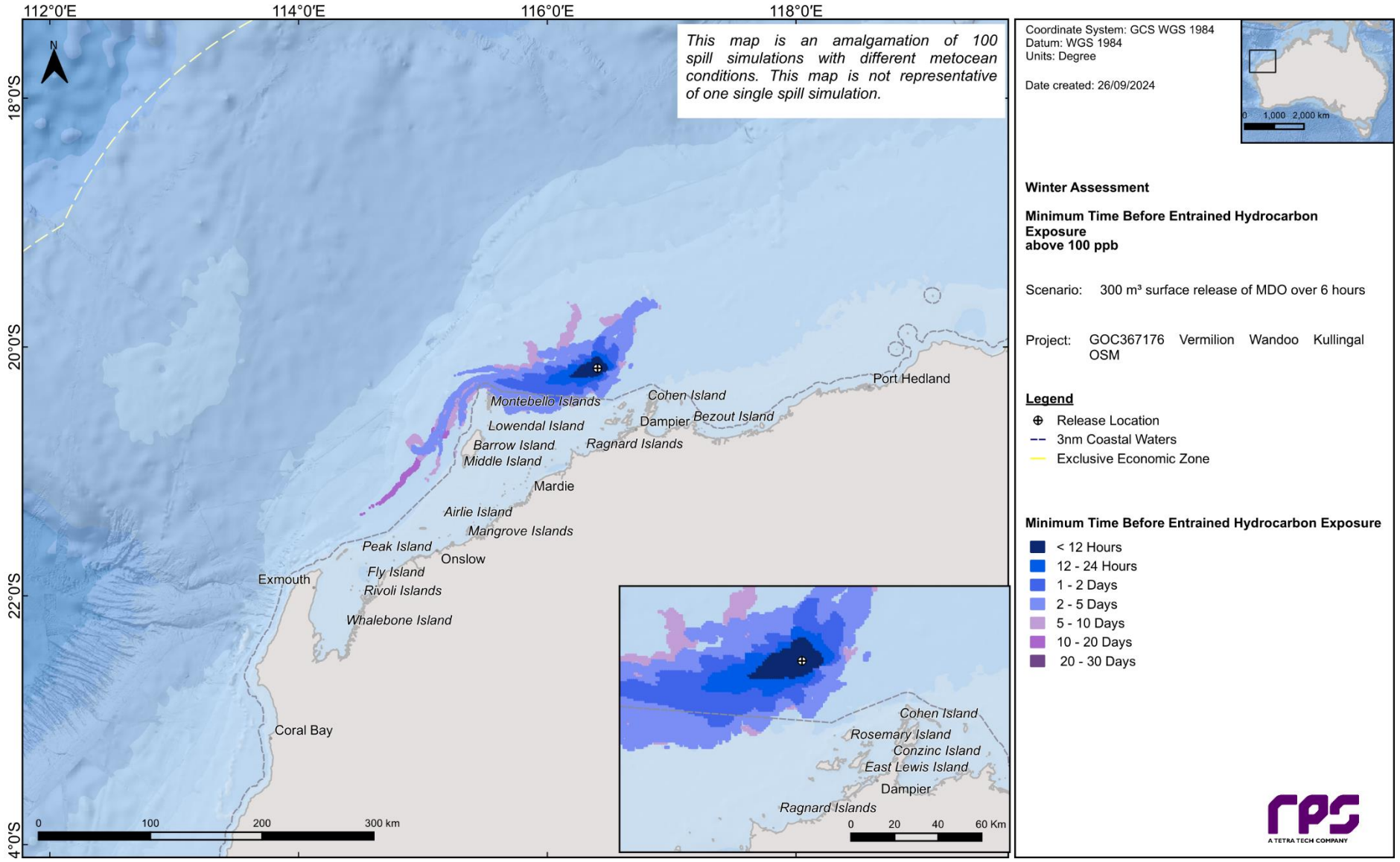

Figure 14.60 Minimum time before entrained hydrocarbon exposure at, or above, 100 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

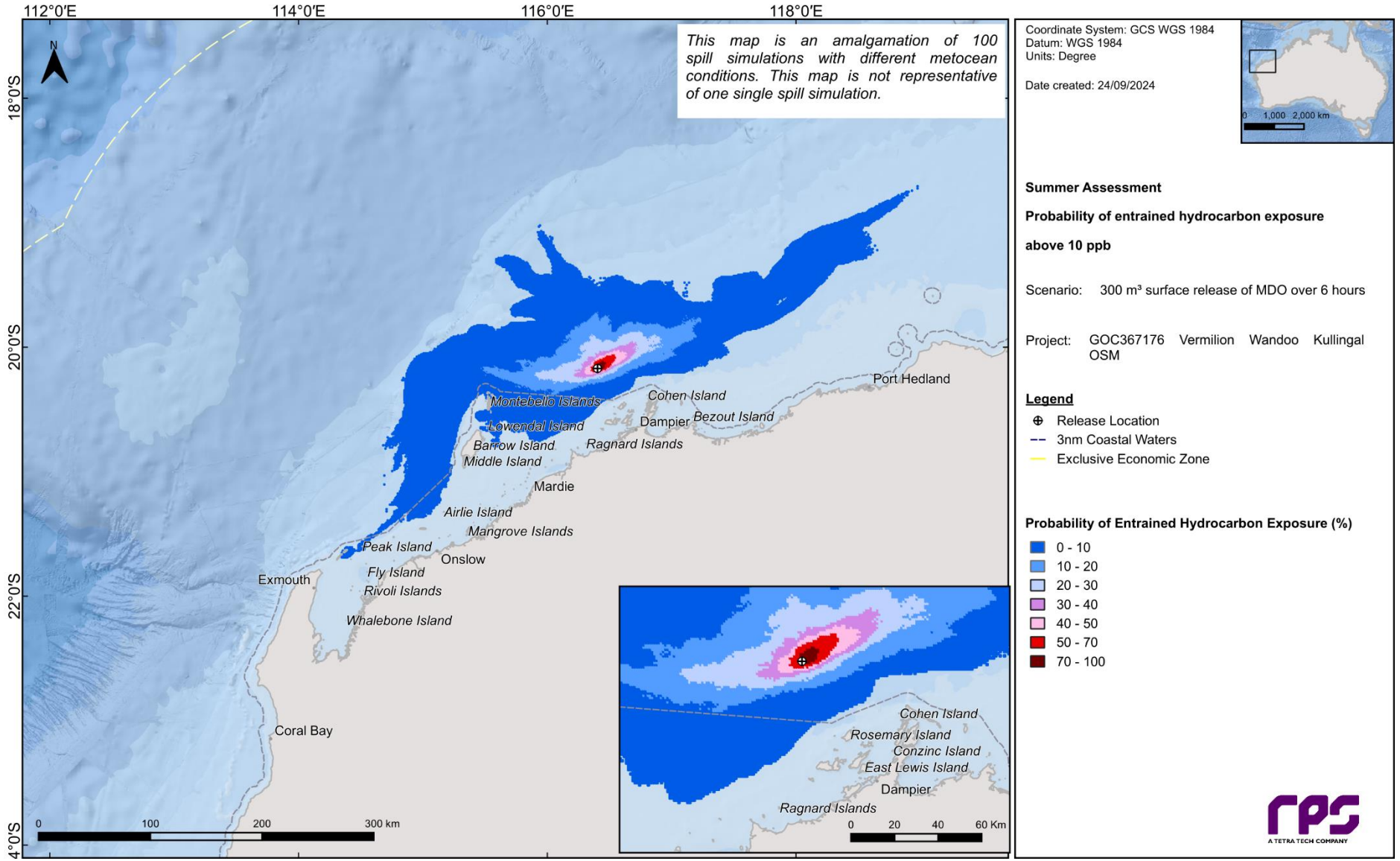

Figure 14.61 Probability of entrained hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

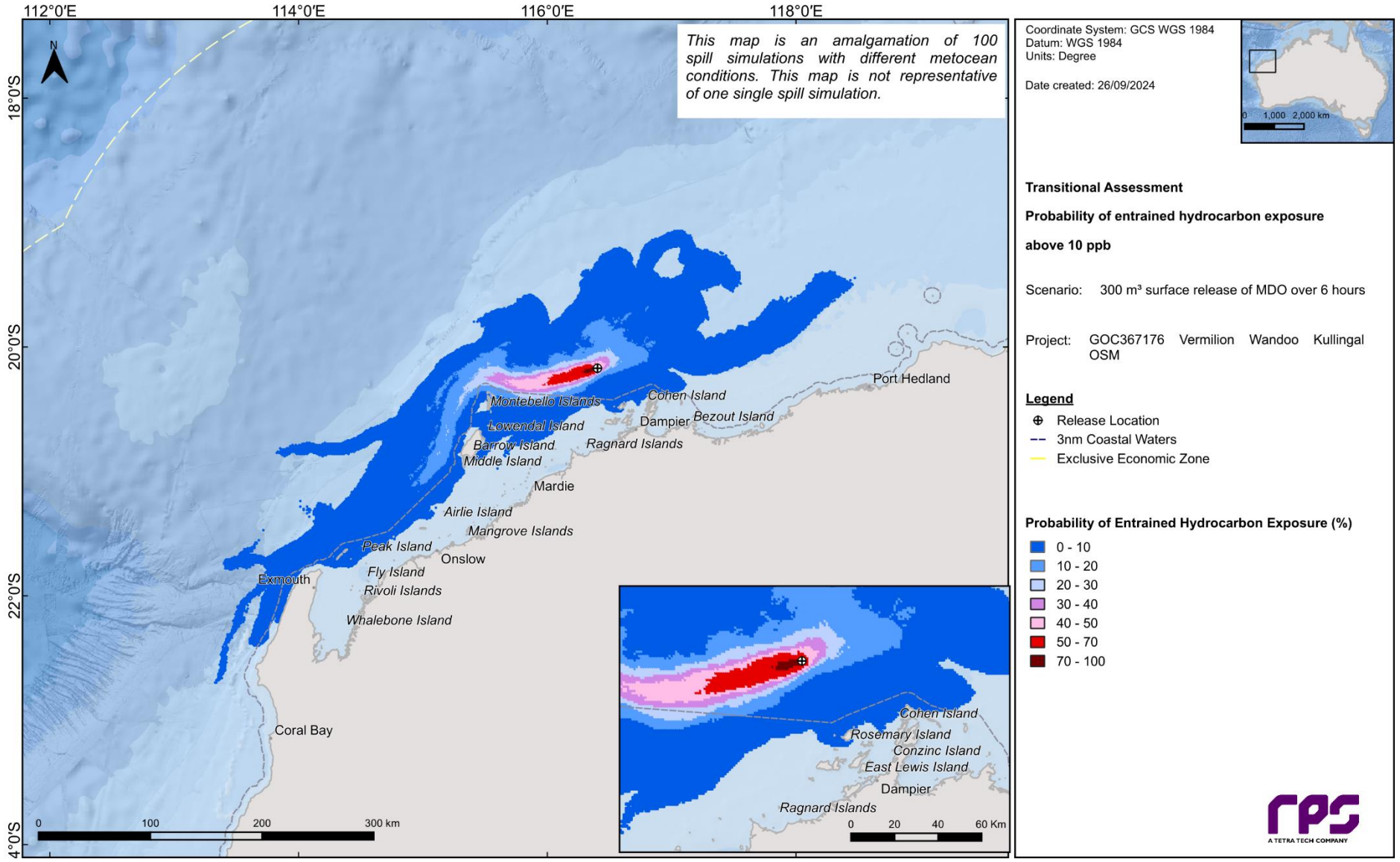

Figure 14.62 Probability of entrained hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

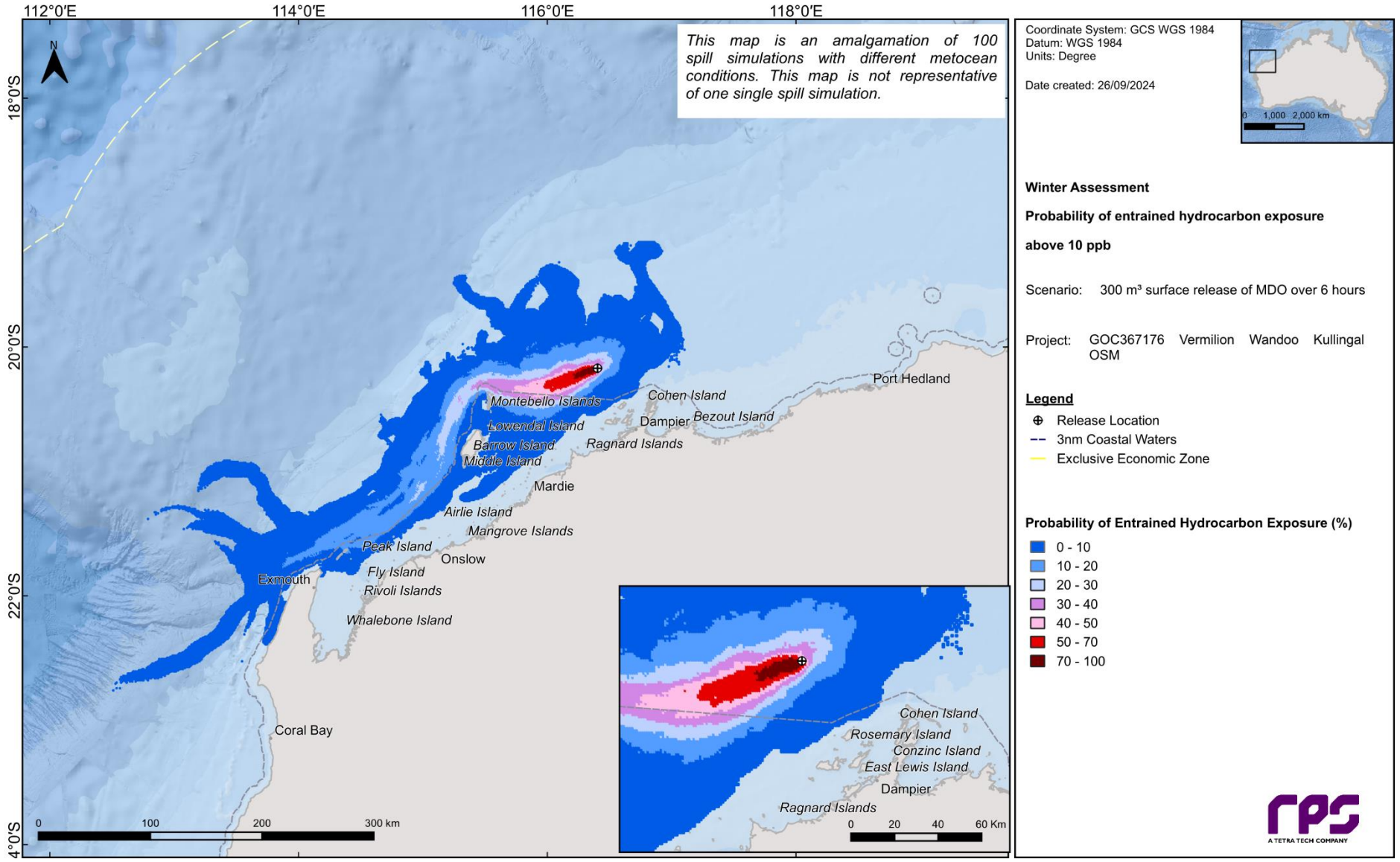

Figure 14.63 Probability of entrained hydrocarbon exposure at, or above, 10 ppb following a vessel collision at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

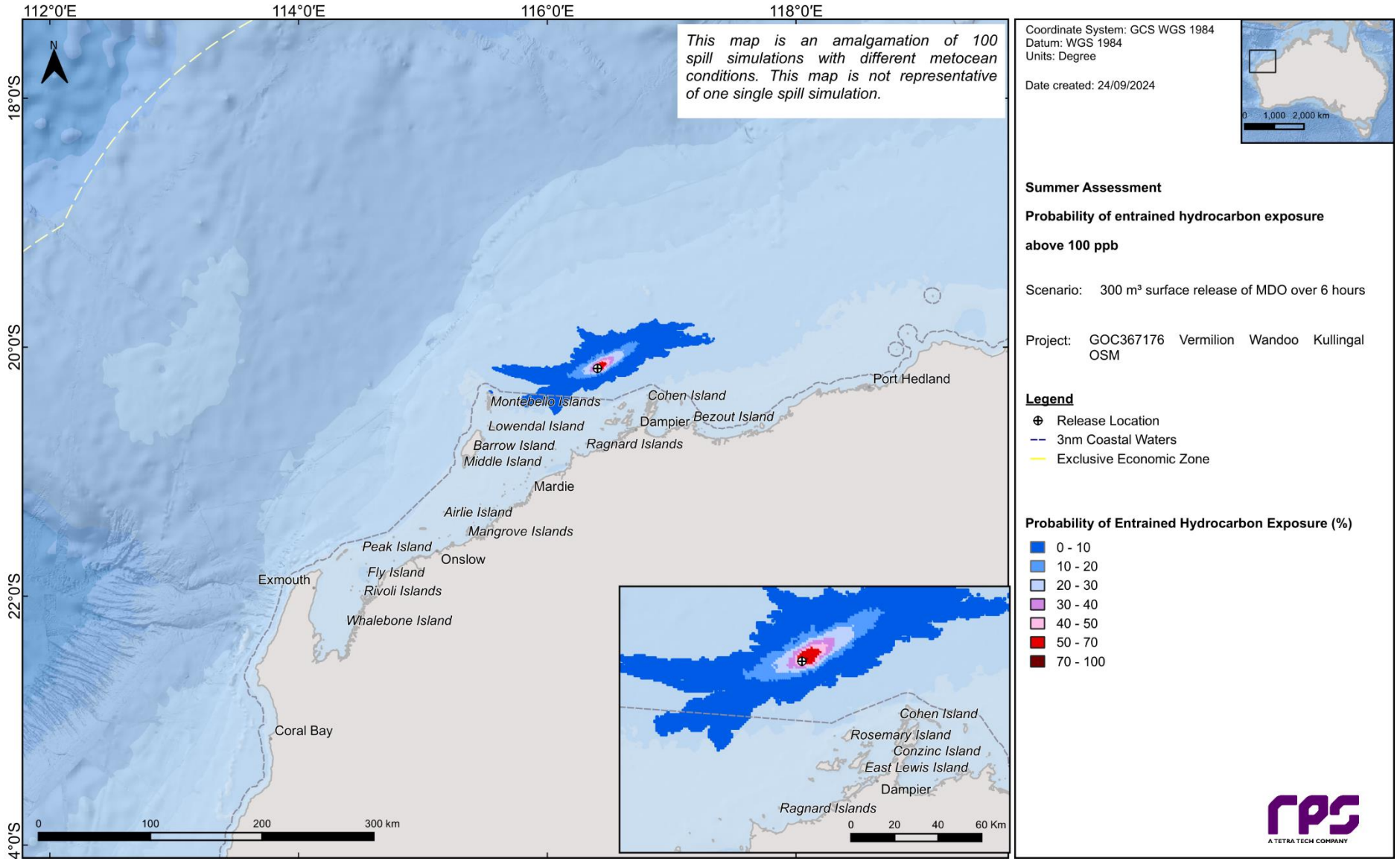

Figure 14.64 Probability of entrained hydrocarbon exposure at, or above, 100 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

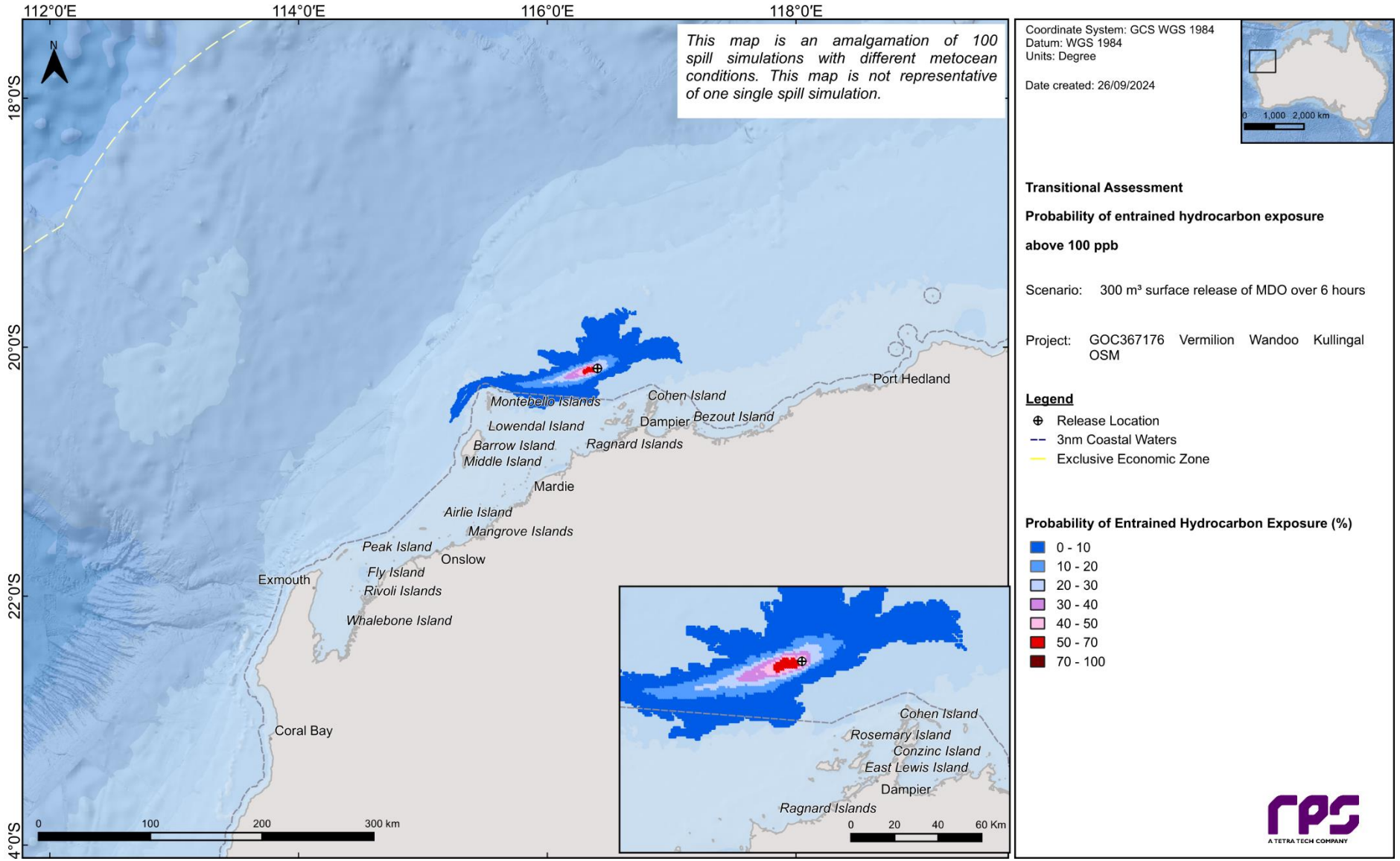

Figure 14.65 Probability of entrained hydrocarbon exposure at, or above, 100 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

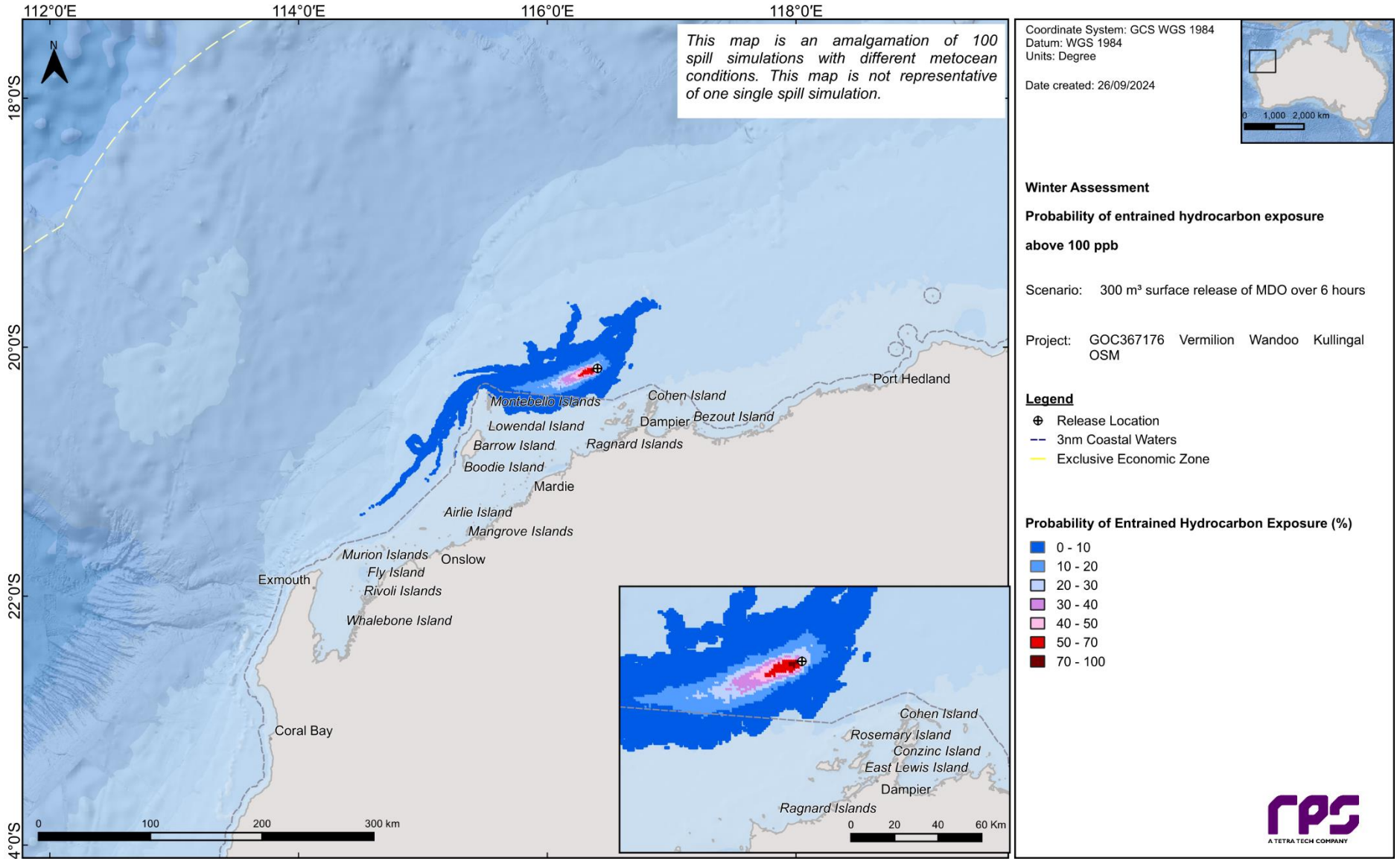

Figure 14.66 Probability of entrained hydrocarbon exposure at, or above, 100 ppb following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

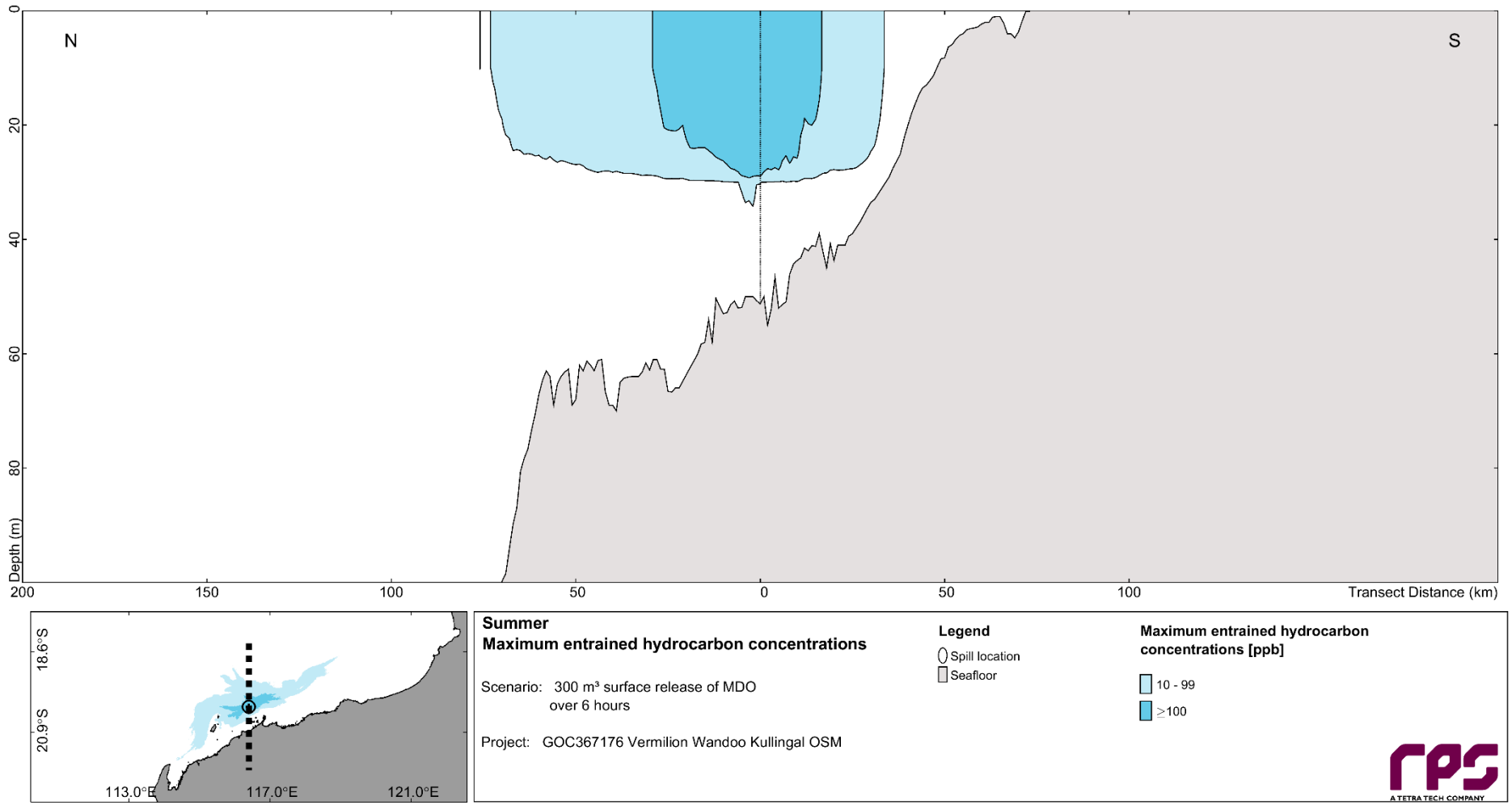

Figure 14.67 North-south cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

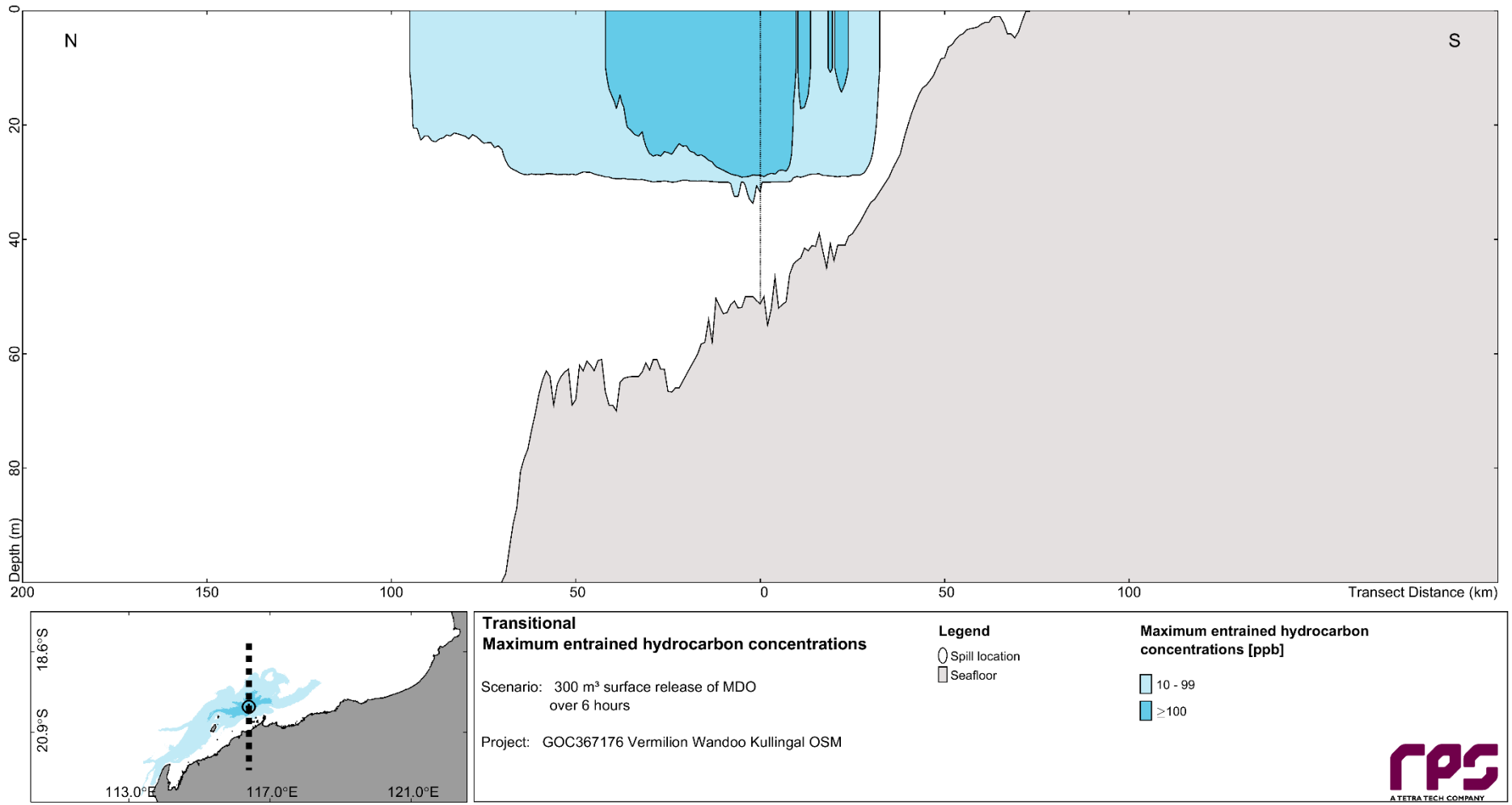

Figure 14.68 North-south cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

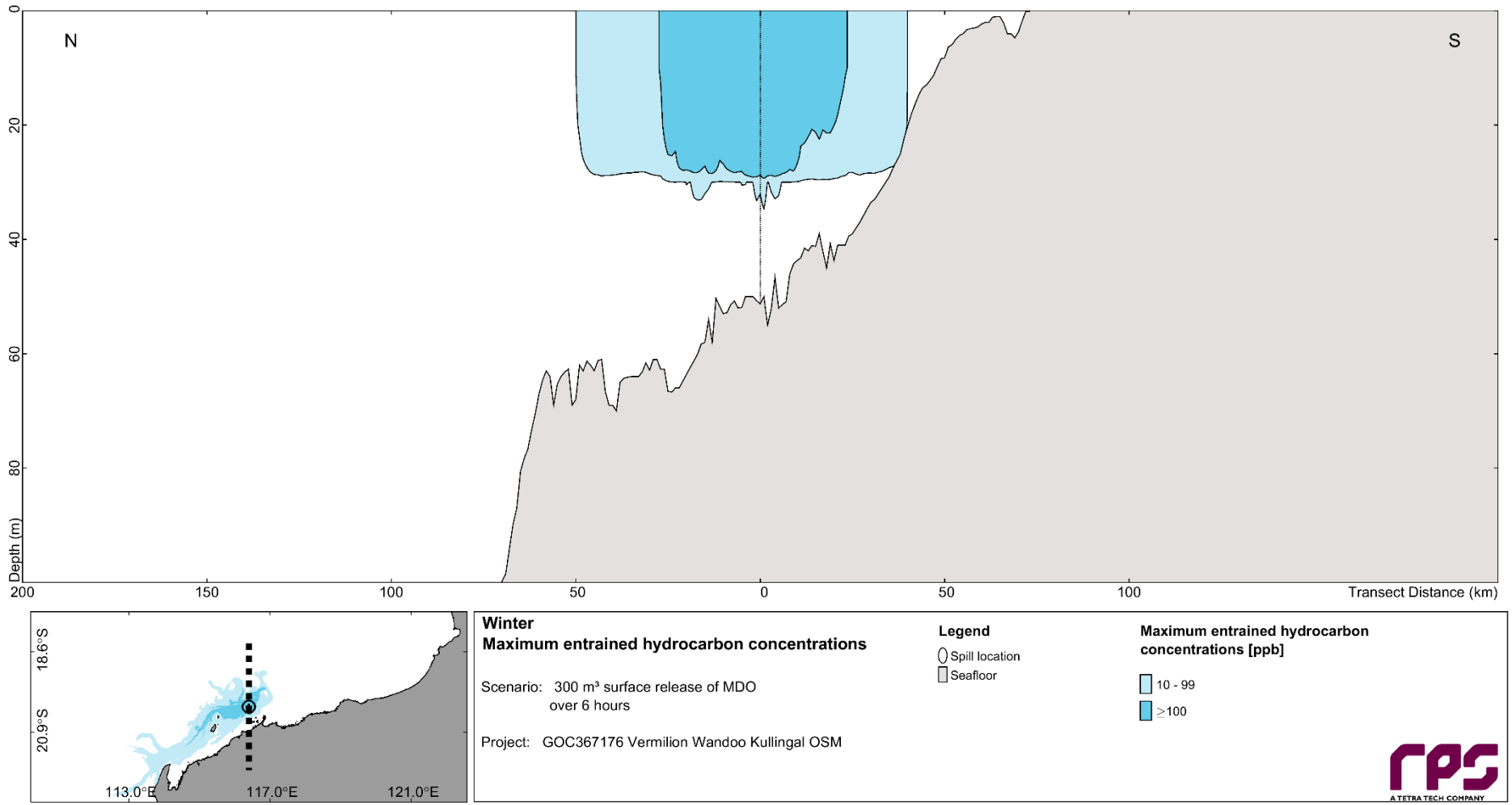

Figure 14.69 North-south cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

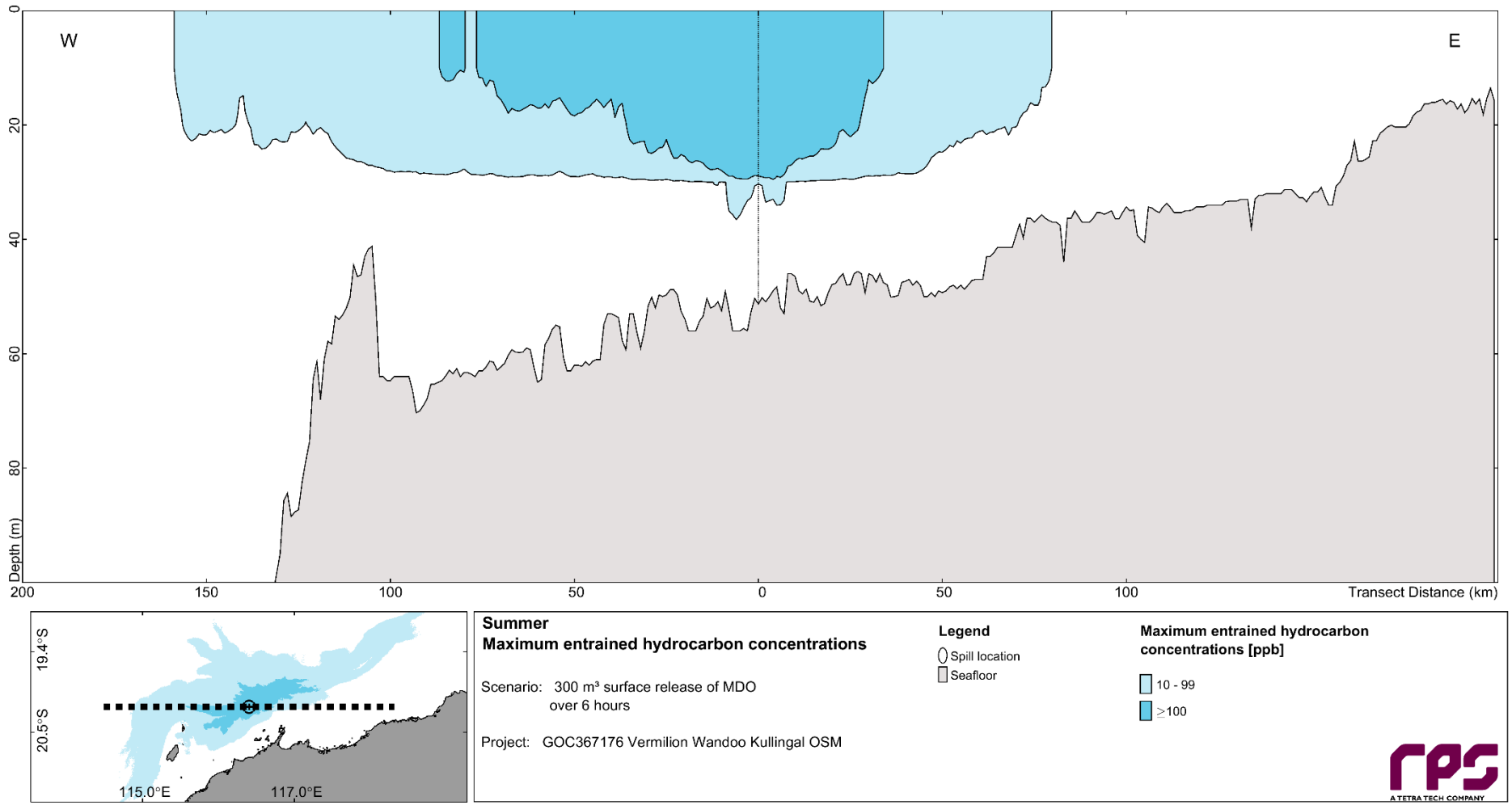

Figure 14.70 East-west cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent summer conditions.

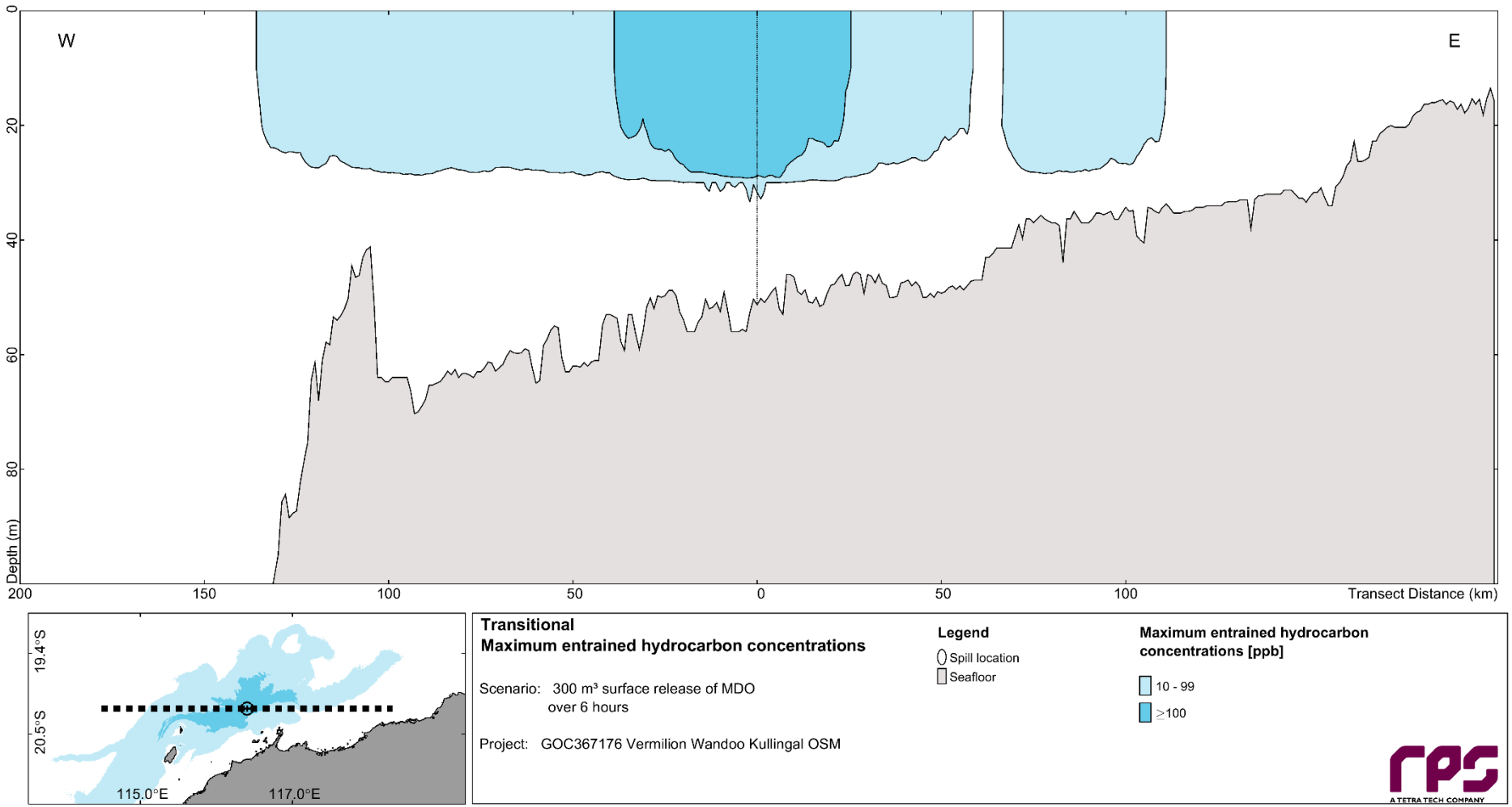

Figure 14.71 East-west cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent transitional conditions.

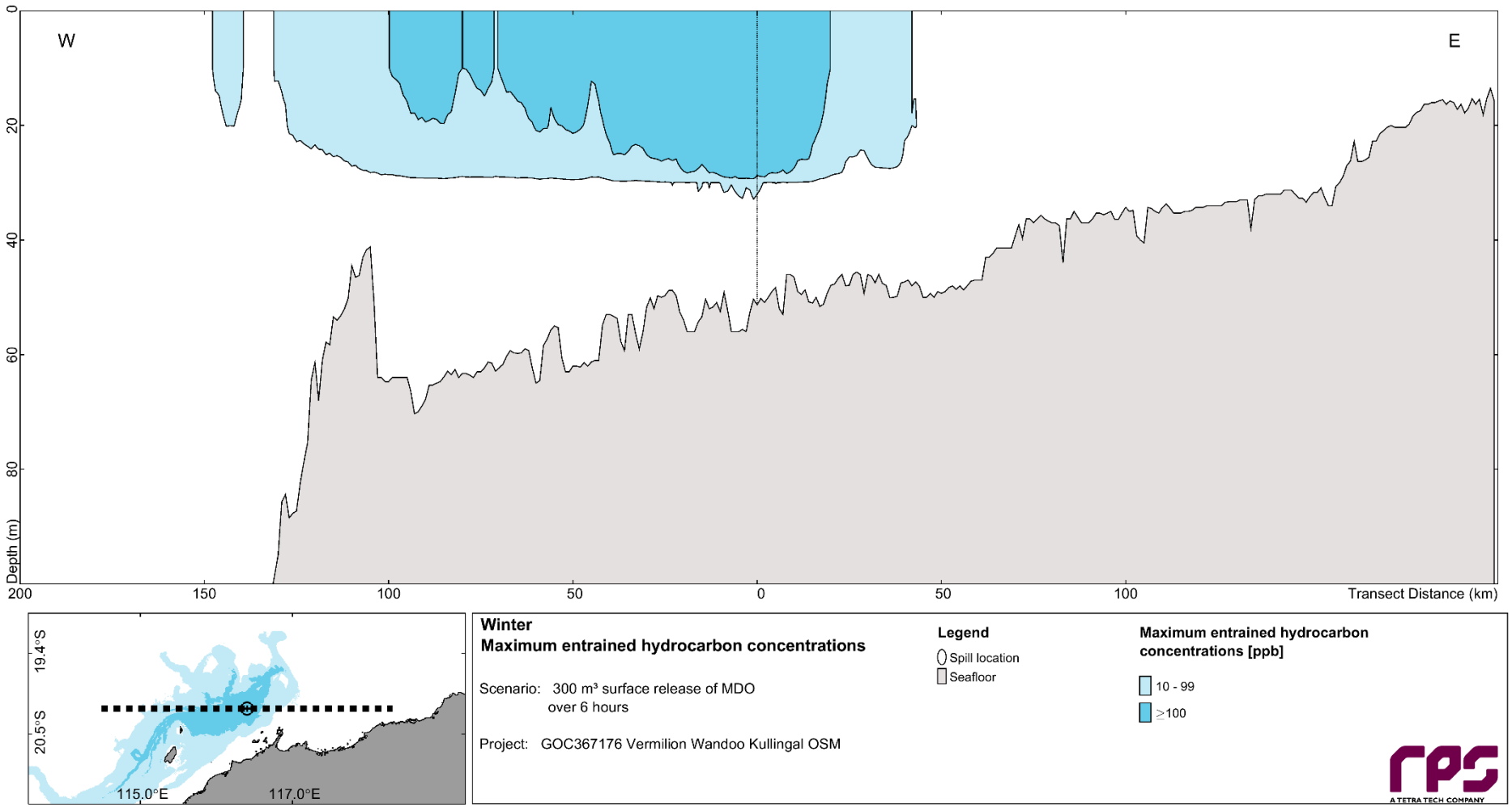

Figure 14.72 East-west cross-section transect of entrained hydrocarbon concentrations following a surface LOWC at Kullingal. The results were calculated from 100 spill simulations and represent winter conditions.

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Appendix C Protected Matters Search Reports

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 02-Apr-2025

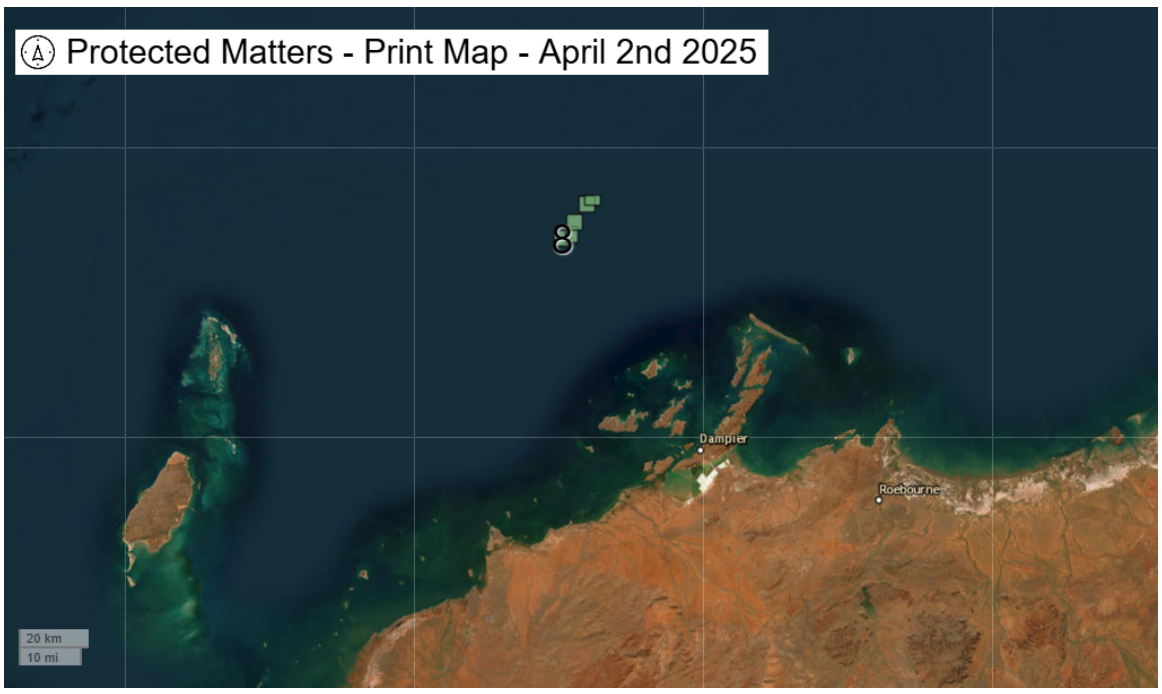

Figure 1: Operational Area

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	1
National Heritage Places:	2
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	66
Listed Migratory Species:	72

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	11
Commonwealth Heritage Places:	2
Listed Marine Species:	122
Whales and Other Cetaceans:	37
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	15
Habitat Critical to the Survival of Marine Turtles:	4

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	33
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	211
Key Ecological Features (Marine):	8
Biologically Important Areas:	45
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Legal Status
The Ningaloo Coast	WA	Declared property

National Heritage Places		[Resource Information]
Name	State	Legal Status
Indigenous		
Dampier Archipelago (including Burrup Peninsula)	WA	Listed place
Natural		
The Ningaloo Coast	WA	Listed place

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anous tenuirostris melanops		
Australian Lesser Noddy [26000]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Malurus leucopterus edouardi White-winged Fairy-wren (Barrow Island), Barrow Island Black-and-white Fairy-wren [26194]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Papasula abbotti Abbott's Booby [59297]	Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
CRUSTACEAN		
Kumonga exleyi		
Cape Range Remipede [86875]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Milyeringa justitia		
Barrow Cave Gudgeon [86867]	Endangered	Species or species habitat known to occur within area
Milyeringa veritas		
Cape Range Cave Gudgeon, Blind Gudgeon [66676]	Vulnerable	Species or species habitat known to occur within area
Ophisternon candidum		
Blind Cave Eel [66678]	Vulnerable	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera musculus Blue Whale [36]	Endangered	Migration route known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Bettongia lesueur Barrow and Boodie Islands subspecies Boodie, Burrowing Bettong (Barrow and Boodie Islands) [88021]	Vulnerable	Species or species habitat known to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Isoodon auratus barrowensis Golden Bandicoot (Barrow Island) [66666]	Vulnerable	Species or species habitat known to occur within area
Lagorchestes conspicillatus conspicillatus Spectacled Hare-wallaby (Barrow Island) [66661]	Vulnerable	Species or species habitat known to occur within area
Lagorchestes hirsutus Central Australian subspecies Mala, Rufous Hare-Wallaby (Central Australia) [88019]	Endangered	Translocated population known to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Osphranter robustus isabellinus Barrow Island Wallaroo, Barrow Island Euro [89262]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Petrogale lateralis lateralis Black-flanked Rock-wallaby, Moororong, Black-footed Rock Wallaby [66647]	Endangered	Species or species habitat known to occur within area
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat known to occur within area
Sousa sahulensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Aipysurus apraefrontalis Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus foliosquama Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Ctenotus zastictus Hamelin Ctenotus [25570]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Liasis olivaceus barroni Pilbara Olive Python [66699]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
SHARK		
Carcharias taurus (west coast population)		
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Congregation or aggregation known to occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Centrophorus uyato		
Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Pristis clavata		
Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis		
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat likely to occur within area
Pristis zijsron		
Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sphyrna lewini		
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
[Phaethon lepturus](#) White-tailed Tropicbird [1014]		Species or species habitat known to occur within area
[Sterna dougallii](#) Roseate Tern [817]		Breeding known to occur within area
[Sternula albifrons](#) Little Tern [82849]	Vulnerable	Breeding known to occur within area
[Sula leucogaster](#) Brown Booby [1022]		Breeding known to occur within area
[Thalassarche carteri](#) Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area
[Thalassarche cauta](#) Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
[Thalassarche impavida](#) Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
[Anoxypristis cuspidata](#) Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat known to occur within area
[Balaenoptera bonaerensis](#) Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Migration route known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat likely to occur within area
Carcharias taurus Grey Nurse Shark [64469]		Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Dugong dugon Dugong [28]		Breeding known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat likely to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50129]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50128]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50127]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50125]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50124]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50126]	WA
Defence - EXMOUTH VLF TRANSMITTER STATION [50122]	WA
Defence - EXMOUTH VLF TRANSMITTER STATION [50123]	WA
Defence - LEARMONTH - AIR WEAPONS RANGE [50193]	WA
Defence - LEARMONTH RADAR SITE - VLAMING HEAD EXMOUTH [50001]	WA
Unknown	
Commonwealth Land - [52236]	WA

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Natural		
Learmonth Air Weapons Range Facility	WA	Listed place
Ningaloo Marine Area - Commonwealth Waters	WA	Listed place

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text

Scientific Name	Threatened Category	Presence Text
Bird		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area
[Anous stolidus](#) Common Noddy [825]		Species or species habitat likely to occur within area
[Anous tenuirostris melanops](#) Australian Lesser Noddy [26000]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
[Ardenna carneipes as Puffinus carneipes](#) Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
[Ardenna pacifica as Puffinus pacificus](#) Wedge-tailed Shearwater [84292]		Breeding known to occur within area
[Bubulcus ibis as Ardea ibis](#) Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Breeding known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Papasula abbotti Abbott's Booby [59297]	Endangered	Species or species habitat may occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area
Pterodroma macroptera Great-winged Petrel [1035]		Foraging, feeding or related behaviour known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Rostratula australis as Rostratula benghalensis (sensu lato)		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua		
Brown Skua [85039]		Species or species habitat may occur within area
Sterna dougallii		
Roseate Tern [817]		Breeding known to occur within area
Sternula albifrons as Sterna albifrons		
Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis as Sterna nereis		
Fairy Tern [82949]		Breeding known to occur within area
Sula leucogaster		
Brown Booby [1022]		Breeding known to occur within area
Thalassarche carteri		
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Thalasseus bengalensis as Sterna bengalensis		
Lesser Crested Tern [66546]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
[Thalasseus bergii as Sterna bergii](#) Greater Crested Tern [83000]		Breeding known to occur within area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area
Fish		
[Acentronura larsonae](#) Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area
[Bulbonaricus brauni](#) Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
[Campichthys galei](#) Gale's Pipefish [66191]		Species or species habitat may occur within area
[Campichthys tricarinatus](#) Three-keel Pipefish [66192]		Species or species habitat may occur within area
[Choeroichthys brachysoma](#) Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
[Choeroichthys latispinosus](#) Muiron Island Pipefish [66196]		Species or species habitat may occur within area
[Choeroichthys suillus](#) Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
[Corythoichthys flavofasciatus](#) Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
[Cosmocampus banneri](#) Roughridge Pipefish [66206]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus multiannulatus Many-banded Pipefish [66717]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus spinosissimus Hedgehog Seahorse [66239]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoxocampus belcheri Black Rock Pipefish [66719]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Mammal		
Dugong dugon Dugong [28]		Breeding known to occur within area
Reptile		
Aipysurus apraefrontalis Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus duboisii Dubois' Sea Snake, Dubois' Seasnake, Reef Shallows Sea Snake [1116]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Aipysurus foliosquama Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus laevis Olive Sea Snake, Olive-brown Sea Snake [1120]		Species or species habitat may occur within area
Aipysurus mosaicus as Aipysurus eydouxii Mosaic Sea Snake [87261]		Species or species habitat may occur within area
Aipysurus pooleorum Shark Bay Sea Snake [66061]		Species or species habitat may occur within area
Aipysurus tenuis Brown-lined Sea Snake, Mjoberg's Sea Snake [1121]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Emydocephalus annulatus Eastern Turtle-headed Sea Snake [1125]		Species or species habitat may occur within area
Ephalophis greyae as Ephalophis greyi Mangrove Sea Snake [93738]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Hydrelaps darwiniensis Port Darwin Sea Snake, Black-ringed Mangrove Sea Snake [1100]		Species or species habitat may occur within area
Hydrophis czeblukovi Fine-spined Sea Snake [59233]		Species or species habitat may occur within area
Hydrophis elegans Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area
Hydrophis kingii as Disteira kingii Spectacled Sea Snake [93511]		Species or species habitat may occur within area
Hydrophis macdowelli as Hydrophis mcdowelli MacDowell's Sea Snake, Small-headed Sea Snake, [75601]		Species or species habitat may occur within area
Hydrophis major as Disteira major Olive-headed Sea Snake [93512]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Sea Snake, Ornate Reef Sea Snake [1111]		Species or species habitat may occur within area
Hydrophis peronii as Acalyptophis peronii Horned Sea Snake [93509]		Species or species habitat may occur within area
Hydrophis platura as Pelamis platurus Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area

Whales and Other Cetaceans		[Resource Information]
Current Scientific Name	Status	Type of Presence
Mammal		

Current Scientific Name	Status	Type of Presence
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Migration route known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Indopacetus pacificus Longman's Beaked Whale [72]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenodelphis hosei Fraser's Dolphin, Sarawak Dolphin [41]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon ginkgodens Gingko-toothed Beaked Whale, Gingko-toothed Whale, Gingko Beaked Whale [59564]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Sousa sahulensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area
Stenella longirostris Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks	[Resource Information]
Park Name	Zone & IUCN Categories
Dampier	Habitat Protection Zone (IUCN IV)
Gascoyne	Habitat Protection Zone (IUCN IV)
Abrolhos	Multiple Use Zone (IUCN VI)
Abrolhos	Multiple Use Zone (IUCN VI)
Dampier	Multiple Use Zone (IUCN VI)
Eighty Mile Beach	Multiple Use Zone (IUCN VI)
Gascoyne	Multiple Use Zone (IUCN VI)
Montebello	Multiple Use Zone (IUCN VI)
Shark Bay	Multiple Use Zone (IUCN VI)
Abrolhos	National Park Zone (IUCN II)
Dampier	National Park Zone (IUCN II)
Gascoyne	National Park Zone (IUCN II)
Ningaloo	National Park Zone (IUCN II)
Ningaloo	Recreational Use Zone (IUCN IV)

Park Name	Zone & IUCN Categories
Ningaloo	Recreational Use Zone (IUCN IV)

Habitat Critical to the Survival of Marine Turtles		[Resource Information]
Scientific Name	Behaviour	Presence
All year (Jun - Aug)		
Natator depressus		
Flatback Turtle [59257]	Nesting	Known to occur
Nov-Feb		
Caretta caretta		
Loggerhead Turtle [1763]	Nesting	Known to occur
Oct - Feb		
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Nesting	Known to occur
Oct - Mar		
Chelonia mydas		
Green Turtle [1765]	Nesting	Known to occur

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Airlie Island	Nature Reserve	WA
Barrow Island	Nature Reserve	WA
Barrow Island	Marine Park	WA
Barrow Island	Marine Management Area	WA
Bessieres Island	Nature Reserve	WA
Boodie, Double Middle Islands	Nature Reserve	WA
Bundegi Coastal Park	5(1)(h) Reserve	WA
Cape Range	National Park	WA
Cape Range (South)	National Park	WA
Great Sandy Island	Nature Reserve	WA
Great Sandy Island	Nature Reserve	WA

Protected Area Name	Reserve Type	State
Jurabi Coastal Park	5(1)(h) Reserve	WA
Little Rocky Island	Nature Reserve	WA
Lowendal Islands	Nature Reserve	WA
Montebello Islands	Conservation Park	WA
Montebello Islands	Conservation Park	WA
Montebello Islands	Marine Park	WA
Muiron Islands	Nature Reserve	WA
Muiron Islands	Marine Management Area	WA
Ningaloo	Marine Park	WA
North Sandy Island	Nature Reserve	WA
Round Island	Nature Reserve	WA
Serrurier Island	Nature Reserve	WA
Thevenard Island	Nature Reserve	WA
Thevenard Island	Nature Reserve	WA
Unnamed WA36909	5(1)(h) Reserve	WA
Unnamed WA36910	5(1)(h) Reserve	WA
Unnamed WA36913	Nature Reserve	WA
Unnamed WA36915	Nature Reserve	WA
Unnamed WA40322	5(1)(h) Reserve	WA
Unnamed WA40877	5(1)(h) Reserve	WA
Unnamed WA44665	5(1)(h) Reserve	WA
Unnamed WA44667	5(1)(h) Reserve	WA

Nationally Important Wetlands

[Resource Information]

Wetland Name	State
Cape Range Subterranean Waterways	WA

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status

Title of referral	Reference	Referral Outcome	Assessment Status
3D Seismic Survey in the Carnarvon Bsin on the North West Shelf	2002/778		Completed
Babylon 3D Marine Seismic Survey, Commonwealth Waters, nr Exmouth WA	2013/7081		Completed
Browse to North West Shelf Development, Indian Ocean, WA	2018/8319		Approval
DAVROS MC 3D marine seismic survey northwaet of Dampier, WA	2013/7092		Completed
Deep Water Northwest Shelf 2D Seismic Survey	2007/3260		Completed
Development of Mutineer and Exeter petroleum fields for oil production, Permit	2003/1033		Completed
Gorgon Gas Development	2003/1294		Post-Approval
Ningaloo Lighthouse Development, 17km north west Exmouth, Western Australia	2020/8693		Post-Approval
North West Shelf Project Extension, Carnarvon Basin, WA	2018/8335		Approval
Offshore Dredge Spoil Disposal - Mardie Project	2024/10054		Referral Decision
Project Highclere Cable Lay and Operation	2022/09203		Completed
Action clearly unacceptable			
Highlands 3D Marine Seismic Survey	2012/6680	Action Clearly Unacceptable	Completed
Controlled action			
'Van Gogh' Petroleum Field Development	2007/3213	Controlled Action	Post-Approval
Anketell Point Iron Ore Processing & Export Port	2009/5120	Controlled Action	Post-Approval
Construct and operate LNG & domestic gas plant including onshore and offshore facilities - Wheatston	2008/4469	Controlled Action	Post-Approval
Develop Jansz-Io deepwater gas field in Permit Areas WA-18-R, WA-25-R and WA-26-	2005/2184	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Development of Angel gas and condensate field, North West Shelf	2004/1805	Controlled Action	Post-Approval
Development of Browse Basin Gas Fields (Upstream)	2008/4111	Controlled Action	Completed
Development of Coniston/Novara fields within the Exmouth Sub-basin	2011/5995	Controlled Action	Post-Approval
Development of Stybarrow petroleum field incl drilling and facility installation	2004/1469	Controlled Action	Post-Approval
Echo-Yodel Production Wells	2000/11	Controlled Action	Post-Approval
Enfield full field development	2001/257	Controlled Action	Post-Approval
Equus Gas Fields Development Project, Carnarvon Basin	2012/6301	Controlled Action	Completed
Eramurra Industrial Salt Project	2021/9027	Controlled Action	Assessment Approach
Eramurra Industrial Salt Project, near Karratha, WA	2019/8448	Controlled Action	Completed
Gorgon Gas Development 4th Train Proposal	2011/5942	Controlled Action	Post-Approval
Gorgon Gas Revised Development	2008/4178	Controlled Action	Post-Approval
Greater Enfield (Vincent) Development	2005/2110	Controlled Action	Post-Approval
Greater Gorgon Development - Optical Fibre Cable, Mainland to Barrow Island	2005/2141	Controlled Action	Completed
Light Crude Oil Production	2001/365	Controlled Action	Post-Approval
Mardie Project, 80 km south west of Karratha, WA	2018/8236	Controlled Action	Post-Approval
Nava-1 Cable System	2001/510	Controlled Action	Completed
Pluto Gas Project	2005/2258	Controlled Action	Completed
Pluto Gas Project Including Site B	2006/2968	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Pyrenees Oil Fields Development	2005/2034	Controlled Action	Post-Approval
Simpson Development	2000/59	Controlled Action	Completed
Simpson Oil Field Development	2001/227	Controlled Action	Post-Approval
Vincent Appraisal Well	2000/22	Controlled Action	Post-Approval
Yardie Creek Road Realignment Project	2021/8967	Controlled Action	Assessment Approach
Not controlled action			
'Goodwyn A' Low Pressure Train Project	2003/914	Not Controlled Action	Completed
'Van Gogh' Oil Appraisal Drilling Program, Exploration Permit Area WA-155-P(1)	2006/3148	Not Controlled Action	Completed
Airlie Island soil and groundwater investigations, Exmouth Gulf, offshore Pilbara coast	2014/7250	Not Controlled Action	Completed
APX-West Fibre-optic telecommunications cable system, WA to Singapore	2013/7102	Not Controlled Action	Completed
Barrow Island 2D Seismic survey	2006/2667	Not Controlled Action	Completed
Bollinger 2D Seismic Survey 200km North of North West Cape WA	2004/1868	Not Controlled Action	Completed
Bultaco-2, Laverda-2, Laverda-3 and Montesa-2 Appraisal Wells	2000/103	Not Controlled Action	Completed
Carnarvon 3D Marine Seismic Survey	2004/1890	Not Controlled Action	Completed
Cazadores 2D seismic survey	2004/1720	Not Controlled Action	Completed
Construction and operation of an unmanned sea platform and connecting pipeline to Varanus Island for	2004/1703	Not Controlled Action	Completed
Controlled Source Electromagnetic Survey	2007/3262	Not Controlled Action	Completed
Development of Halyard Field off the west coast of WA	2010/5611	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Development of iron ore facilities	2013/7013	Not Controlled Action	Completed
Differential Global Positioning System (DGPS)	2001/445	Not Controlled Action	Completed
Drilling of an exploration well Gats-1 in Permit Area WA-261-P	2004/1701	Not Controlled Action	Completed
Eagle-1 Exploration Drilling, North West Shelf, WA	2019/8578	Not Controlled Action	Completed
Echo A Development WA-23-L, WA-24-L	2005/2042	Not Controlled Action	Completed
Exploration drilling well WA-155-P(1)	2003/971	Not Controlled Action	Completed
Exploration of appraisal wells	2006/3065	Not Controlled Action	Completed
Exploration Well (Taunton-2)	2002/731	Not Controlled Action	Completed
Exploration Well in Permit Area WA-155-P(1)	2002/759	Not Controlled Action	Completed
Exploratory drilling in permit area WA-225-P	2001/490	Not Controlled Action	Completed
Extension of Simpson Oil Platforms & Wells	2002/685	Not Controlled Action	Completed
HCA05X Macedon Experimental Survey	2004/1926	Not Controlled Action	Completed
Hess Exploration Drilling Programme	2007/3566	Not Controlled Action	Completed
Huascaran-1 exploration well (WA-292-P)	2001/539	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO West Submarine Telecommunications Cable, WA	2017/8126	Not Controlled Action	Completed
Infill Production Well (Griffin-9)	2001/417	Not Controlled Action	Completed
Jansz-2 and 3 Appraisal Wells	2002/754	Not Controlled Action	Completed
Klammer 2D Seismic Survey	2002/868	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Maia-Gaea Exploration wells	2000/17	Not Controlled Action	Completed
Manaslu - 1 and Huascaran - 1 Offshore Exploration Wells	2001/235	Not Controlled Action	Completed
Mermaid Marine Australia Desalination Project	2011/5916	Not Controlled Action	Completed
Montesa-1 and Bultaco-1 Exploration Wells	2000/102	Not Controlled Action	Completed
Murujuga archaeological excavation, collection and sampling, Dampier Archipelago, WA	2014/7160	Not Controlled Action	Completed
North Rankin B gas compression facility	2005/2500	Not Controlled Action	Completed
Pipeline System Modifications Project	2000/3	Not Controlled Action	Completed
Project Highclere Geophysical Survey	2021/9023	Not Controlled Action	Completed
Searipple gas and condensate field development	2000/89	Not Controlled Action	Completed
Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin	2004/1700	Not Controlled Action	Completed
Spool Base Facility	2001/263	Not Controlled Action	Completed
Subsea Gas Pipeline From Stybarrow Field to Griffin Venture Gas Export Pipeline	2005/2033	Not Controlled Action	Completed
sub-sea tieback of Perseus field wells	2004/1326	Not Controlled Action	Completed
Telstra North Rankin Spur Fibre Optic Cable	2016/7836	Not Controlled Action	Completed
Thevenard Island Retirement Project	2015/7423	Not Controlled Action	Completed
To construct and operate an offshore submarine fibre optic cable, WA	2014/7373	Not Controlled Action	Completed
Wanda Offshore Research Project, 80 km north-east of Exmouth, WA	2018/8293	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Western Flank Gas Development	2005/2464	Not Controlled Action	Completed
Wheatstone 3D seismic survey, 70km north of Barrow Island	2004/1761	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Kate' 3D marine seismic survey, exploration permits WA-320-P and WA-345-P, 60km	2005/2037	Not Controlled Action (Particular Manner)	Post-Approval
'Tourmaline' 2D marine seismic survey, permit areas WA-323-P, WA-330-P and WA-32	2005/2282	Not Controlled Action (Particular Manner)	Post-Approval
"Leanne" offshore 3D seismic exploration, WA-356-P	2005/1938	Not Controlled Action (Particular Manner)	Post-Approval
2D and 3D seismic surveys	2005/2151	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey	2008/4493	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2005/2146	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Permit Area WA-352-P	2008/4628	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey within permit WA-291	2007/3265	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey	2008/4281	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey (WA-482-P, WA-363-P), WA	2013/6761	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
3D Marine Seismic Survey in Permit Areas WA-15-R, WA-18-R, WA-205-P, WA-253-P, WA-267-P and WA-268-P	2003/1271	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey in WA 457-P & WA 458-P, North West Shelf, offshore WA	2013/6862	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey over petroleum title WA-268-P	2007/3458	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Surveys - Contos CT-13 & Supertubes CT-13, offshore WA	2013/6901	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic survey	2006/2715	Not Controlled Action (Particular Manner)	Post-Approval
3D Seismic Survey, WA	2008/4428	Not Controlled Action (Particular Manner)	Post-Approval
3D sesmic survey	2006/2781	Not Controlled Action (Particular Manner)	Post-Approval
Acheron Non-Exclusive 2D Seismic Survey	2009/4968	Not Controlled Action (Particular Manner)	Post-Approval
Acheron Non-Exclusive 2D Seismic Survey	2008/4565	Not Controlled Action (Particular Manner)	Post-Approval
Apache Northwest Shelf Van Gogh Field Appraisal Drilling Program	2007/3495	Not Controlled Action (Particular Manner)	Post-Approval
Aperio 3D Marine Seismic Survey, WA	2012/6648	Not Controlled Action (Particular Manner)	Post-Approval
Artemis-1 Drilling Program (WA-360-P)	2010/5432	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Australia to Singapore Fibre Optic Submarine Cable System	2011/6127	Not Controlled Action (Particular Manner)	Post-Approval
Balnaves Condensate Field Development	2011/6188	Not Controlled Action (Particular Manner)	Post-Approval
Cable Seismic Exploration Permit areas WA-323-P and WA-330-P	2008/4227	Not Controlled Action (Particular Manner)	Post-Approval
Cerberus exploration drilling campaign, Carnarvon Basin, WA	2016/7645	Not Controlled Action (Particular Manner)	Post-Approval
CGGVERITAS 2010 2D Seismic Survey	2010/5714	Not Controlled Action (Particular Manner)	Post-Approval
Charon 3D Marine Seismic Survey	2007/3477	Not Controlled Action (Particular Manner)	Post-Approval
Consturction & operation of the Varanus Island kitchen & mess cyclone refuge building, compression p	2013/6952	Not Controlled Action (Particular Manner)	Post-Approval
Coverack Marine Seismic Survey	2001/399	Not Controlled Action (Particular Manner)	Post-Approval
Cue Seismic Survey within WA-359-P, WA-361-P and WA-360-P	2007/3647	Not Controlled Action (Particular Manner)	Post-Approval
CVG 3D Marine Seismic Survey	2012/6654	Not Controlled Action (Particular Manner)	Post-Approval
Decommissioning of the Legendre facilities	2010/5681	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Deep Water Drilling Program	2010/5532	Not Controlled Action (Particular Manner)	Post-Approval
Demeter 3D Seismic Survey, off Dampier, WA	2002/900	Not Controlled Action (Particular Manner)	Post-Approval
Diesel Fuel Bunker Operation	2012/6289	Not Controlled Action (Particular Manner)	Post-Approval
Draeck 3D Marine Seismic Survey, WA-205-P	2006/3067	Not Controlled Action (Particular Manner)	Post-Approval
Drilling 35-40 offshore exploration wells in deep water	2008/4461	Not Controlled Action (Particular Manner)	Post-Approval
Earthworks for kitchen/mess, cyclone refuge building & Compression Plant, Varanus Island	2013/6900	Not Controlled Action (Particular Manner)	Post-Approval
Eendracht Multi-Client 3D Marine Seismic Survey	2009/4749	Not Controlled Action (Particular Manner)	Post-Approval
Effect of marine seismic sounds to demersal fish and pearl oysters, north-west WA	2018/8169	Not Controlled Action (Particular Manner)	Post-Approval
Enfield M3 & Vincent 4D Marine Seismic Surveys	2008/3981	Not Controlled Action (Particular Manner)	Completed
Enfield M3 4D, Vincent 4D & 4D Line Test Marine Seismic Surveys	2008/4122	Not Controlled Action (Particular Manner)	Post-Approval
Enfield M4 4D Marine Seismic Survey	2008/4558	Not Controlled Action (Particular Manner)	Post-Approval
Enfield oilfield 3D Seismic Survey	2006/3132	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Exmouth West 2D Marine Seismic Survey	2008/4132	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of Zeus-1 well	2008/4351	Not Controlled Action (Particular Manner)	Post-Approval
Fletcher-Finucane Development, WA26-L and WA191-P	2011/6123	Not Controlled Action (Particular Manner)	Post-Approval
Foxhound 3D Non-Exclusive Marine Seismic Survey	2009/4703	Not Controlled Action (Particular Manner)	Post-Approval
Gazelle 3D Marine Seismic Survey in WA-399-P and WA-42-L	2010/5570	Not Controlled Action (Particular Manner)	Post-Approval
Geco Eagle 3D Marine Seismic Survey	2008/3958	Not Controlled Action (Particular Manner)	Post-Approval
Glencoe 3D Marine Seismic Survey WA-390-P	2007/3684	Not Controlled Action (Particular Manner)	Post-Approval
Greater Western Flank Phase 1 gas Development	2011/5980	Not Controlled Action (Particular Manner)	Post-Approval
Grimalkin 3D Seismic Survey	2008/4523	Not Controlled Action (Particular Manner)	Post-Approval
Guacamole 2D Marine Seismic Survey	2008/4381	Not Controlled Action (Particular Manner)	Post-Approval
Harmony 3D Marine Seismic Survey	2012/6699	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Harpy 1 exploration well	2001/183	Not Controlled Action (Particular Manner)	Post-Approval
Huzzas MC3D Marine Seismic Survey (HZ-13) Carnarvon Basin, offshore WA	2013/7003	Not Controlled Action (Particular Manner)	Post-Approval
Huzzas phase 2 marine seismic survey, Exmouth Plateau, Northern Carnarvon Basin, WA	2013/7093	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
John Ross & Rosella Off Bottom Cable Seismic Exploration Program	2008/3966	Not Controlled Action (Particular Manner)	Post-Approval
Judo Marine 3D Seismic Survey within and adjacent to WA-412-P	2008/4630	Not Controlled Action (Particular Manner)	Post-Approval
Judo Marine 3D Seismic Survey within and adjacent to WA-412-P	2009/4801	Not Controlled Action (Particular Manner)	Post-Approval
Julimar Brunello Gas Development Project	2011/5936	Not Controlled Action (Particular Manner)	Post-Approval
Klimt 2D Marine Seismic Survey	2007/3856	Not Controlled Action (Particular Manner)	Post-Approval
Laverda 3D Marine Seismic Survey and Vincent M1 4D Marine Seismic Survey	2010/5415	Not Controlled Action (Particular Manner)	Post-Approval
Laying a submarine optical fibre telecommunications cable, Perth to Singapore and Jakarta	2014/7332	Not Controlled Action (Particular Manner)	Post-Approval
Leopard 2D marine seismic survey	2005/2290	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Lion 2D Marine Seismic Survey	2007/3777	Not Controlled Action (Particular Manner)	Post-Approval
Macedon Gas Field Development	2008/4605	Not Controlled Action (Particular Manner)	Post-Approval
Marine reconnaissance survey	2008/4466	Not Controlled Action (Particular Manner)	Post-Approval
Moosehead 2D seismic survey within permit WA-192-P	2005/2167	Not Controlled Action (Particular Manner)	Post-Approval
Munmorah 2D seismic survey within permits WA-308/9-P	2003/970	Not Controlled Action (Particular Manner)	Post-Approval
Ocean Bottom Cable Seismic Program, WA-264-P	2007/3844	Not Controlled Action (Particular Manner)	Post-Approval
Ocean Bottom Cable Seismic Survey	2005/2017	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Canning Multi Client 2D Marine Seismic Survey	2010/5393	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Drilling Campaign	2011/5830	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Fibre Optic Cable Network Construction & Operation, Port Hedland WA to Darwin NT	2014/7223	Not Controlled Action (Particular Manner)	Post-Approval
Orcus 3D Marine Seismic Survey in WA-450-P	2010/5723	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Osprey and Dionysus Marine Seismic Survey	2011/6215	Not Controlled Action (Particular Manner)	Post-Approval
Palta-1 exploration well in Petroleum Permit Area WA-384-P	2011/5871	Not Controlled Action (Particular Manner)	Post-Approval
Phoenix 3D Seismic Survey, Bedout Sub-Basin	2010/5360	Not Controlled Action (Particular Manner)	Post-Approval
Pomodoro 3D Marine Seismic Survey in WA-426-P and WA-427-P	2010/5472	Not Controlled Action (Particular Manner)	Post-Approval
Port Walcott upgrade, dredging & spoil disposal, & channel realignment	2006/2806	Not Controlled Action (Particular Manner)	Post-Approval
Pyrenees 4D Marine Seismic Monitor Survey, HCA12A	2012/6579	Not Controlled Action (Particular Manner)	Post-Approval
Pyrenees-Macedon 3D marine seismic survey	2005/2325	Not Controlled Action (Particular Manner)	Post-Approval
Quiberon 2D Seismic Survey, permit area WA-385P, offshore of Carnarvon	2009/5077	Not Controlled Action (Particular Manner)	Post-Approval
Reindeer gas reservior development, Devil Creek, Carnarvon Basin - WA	2007/3917	Not Controlled Action (Particular Manner)	Post-Approval
Rose 3D Seismic Program	2008/4239	Not Controlled Action (Particular Manner)	Post-Approval
Rydal-1 Petroleum Exploration Well, WA	2012/6522	Not Controlled Action (Particular Manner)	Post-Approval
Salsa 3D Marine Seismic Survey	2010/5629	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Santos Winchester three dimensional seismic survey - WA-323-P & WA-330-P	2011/6107	Not Controlled Action (Particular Manner)	Post-Approval
Scarborough Development nearshore component, NWS, WA	2018/8362	Not Controlled Action (Particular Manner)	Post-Approval
Skorpion Marine Seismic Survey WA	2001/416	Not Controlled Action (Particular Manner)	Post-Approval
Stag 4D & Reindeer MAZ Marine Seismic Surveys, WA	2013/7080	Not Controlled Action (Particular Manner)	Post-Approval
Stag Off-bottom Cable Seismic Survey	2007/3696	Not Controlled Action (Particular Manner)	Post-Approval
Stybarrow 4D Marine Seismic Survey	2011/5810	Not Controlled Action (Particular Manner)	Post-Approval
Stybarrow Baseline 4D marine seismic survey	2008/4530	Not Controlled Action (Particular Manner)	Post-Approval
Tantabiddi Boat Ramp Sand Bypassing	2015/7411	Not Controlled Action (Particular Manner)	Post-Approval
Tidepole Maz 3D Seismic Survey Campaign	2007/3706	Not Controlled Action (Particular Manner)	Post-Approval
Tortilla 2D Seismic Survey, WA	2011/6110	Not Controlled Action (Particular Manner)	Post-Approval
Triton 3D Marine Seismic Survey, WA-2-R and WA-3-R	2006/2609	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Undertake a 3D marine seismic survey	2010/5695	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5679	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5715	Not Controlled Action (Particular Manner)	Post-Approval
Vincent M1 and Enfield M5 4D Marine Seismic Survey	2010/5720	Not Controlled Action (Particular Manner)	Post-Approval
Warramunga Non-Inclusive 3D Seismic Survey	2008/4553	Not Controlled Action (Particular Manner)	Post-Approval
West Anchor 3D Marine Seismic Survey	2008/4507	Not Controlled Action (Particular Manner)	Post-Approval
West Panaeus 3D seismic survey	2006/3141	Not Controlled Action (Particular Manner)	Post-Approval
Westralia SPAN Marine Seismic Survey, WA & NT	2012/6463	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone 3D MAZ Marine Seismic Survey	2011/6058	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone Iago Appraisal Well Drilling	2008/4134	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone Iago Appraisal Well Drilling	2007/3941	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
3D Marine Seismic Survey in the offshore northwest Carnarvon	2011/6175	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Basin			
3D Seismic Survey	2008/4219	Referral Decision	Completed
Bianchi 3D Marine Seismic Survey, Carnavon Basin, WA	2013/7078	Referral Decision	Completed
CVG 3D Marine Seismic Survey	2012/6270	Referral Decision	Completed
Enfield 4D Marine Seismic Surveys, Production Permit WA-28-L	2005/2370	Referral Decision	Completed
Rose 3D Seismic acquisition survey	2008/4220	Referral Decision	Completed
Stybarrow Baseline 4D Marine Seismic Survey (Permit Areas WA-255-P, WA-32-L, WA-	2008/4165	Referral Decision	Completed
Two Dimensional Transition Zone Seismic Survey - TP/7 (R1)	2010/5507	Referral Decision	Completed
Varanus Island Compression Project	2012/6698	Referral Decision	Completed

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Ancient coastline at 125 m depth contour	North-west
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	North-west
Commonwealth waters adjacent to Ningaloo Reef	North-west
Continental Slope Demersal Fish Communities	North-west
Exmouth Plateau	North-west
Glomar Shoals	North-west
Perth Canyon and adjacent shelf break, and other west coast canyons	South-west
Western demersal slope and associated fish communities	South-west

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence

Scientific Name	Behaviour	Presence
Dugong		
Dugong dugon Dugong [28]	Breeding	Known to occur
Dugong dugon Dugong [28]	Calving	Known to occur
Dugong dugon Dugong [28]	Foraging (high density seagrass beds)	Known to occur
Dugong dugon Dugong [28]	Nursing	Known to occur
Marine Turtles		
Caretta caretta Loggerhead Turtle [1763]	Foraging	Known to occur
Caretta caretta Loggerhead Turtle [1763]	Internesting buffer	Known to occur
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur
Chelonia mydas Green Turtle [1765]	Aggregation	Known to occur
Chelonia mydas Green Turtle [1765]	Basking	Known to occur
Chelonia mydas Green Turtle [1765]	Foraging	Known to occur
Chelonia mydas Green Turtle [1765]	Internesting	Known to occur
Chelonia mydas Green Turtle [1765]	Internesting buffer	Known to occur
Chelonia mydas Green Turtle [1765]	Mating	Known to occur

Scientific Name	Behaviour	Presence
Chelonia mydas Green Turtle [1765]	Migration corridor	Known to occur
Chelonia mydas Green Turtle [1765]	Nesting	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Foraging	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Internesting	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Internesting buffer	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Mating	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Migration corridor	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Nesting	Known to occur
Natator depressus Flatback Turtle [59257]	Aggregation	Known to occur
Natator depressus Flatback Turtle [59257]	Foraging	Known to occur
Natator depressus Flatback Turtle [59257]	Internesting	Known to occur
Natator depressus Flatback Turtle [59257]	Internesting buffer	Known to occur
Natator depressus Flatback Turtle [59257]	Mating	Known to occur
Natator depressus Flatback Turtle [59257]	Migration corridor	Known to occur

Scientific Name	Behaviour	Presence
Natator depressus Flatback Turtle [59257]	Nesting	Known to occur
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [84292]	Breeding	Known to occur
Fregata ariel Lesser Frigatebird [1012]	Breeding	Known to occur
Onychoprion anaethetus Bridled Tern [82845]	Foraging (in high numbers)	Known to occur
Onychoprion fuscata Sooty Tern [82847]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging (in high numbers)	Known to occur
Puffinus assimilis tunneyi Little Shearwater [59363]	Foraging (in high numbers)	Known to occur
Sterna dougallii Roseate Tern [817]	Breeding	Known to occur
Sternula nereis Fairy Tern [82949]	Breeding	Known to occur
Sula leucogaster Brown Booby [1022]	Breeding	Known to occur
Thalasseus bengalensis Lesser Crested Tern [66546]	Breeding	Known to occur
Sharks		
Rhincodon typus Whale Shark [66680]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Rhincodon typus Whale Shark [66680]	Foraging (high density prey)	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Migration	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Resting	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 03-Apr-2025

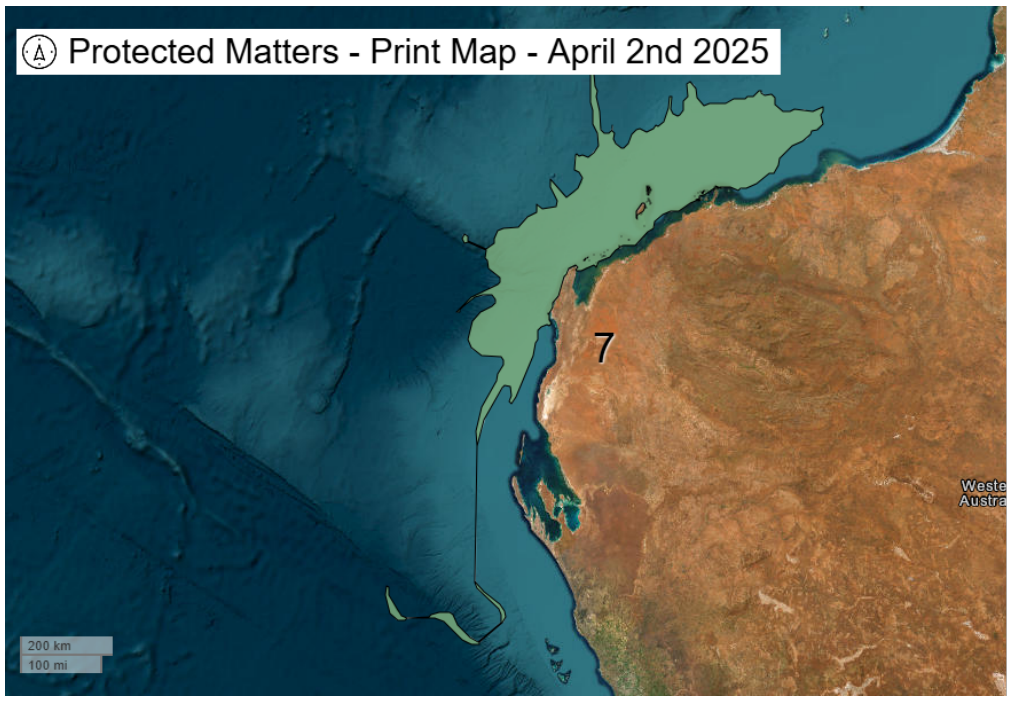

Figure 1: Hydrocarbon Area

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	1
National Heritage Places:	2
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	2
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	66
Listed Migratory Species:	72

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	11
Commonwealth Heritage Places:	2
Listed Marine Species:	122
Whales and Other Cetaceans:	37
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	15
Habitat Critical to the Survival of Marine Turtles:	4

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	33
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	211
Key Ecological Features (Marine):	8
Biologically Important Areas:	45
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Legal Status
The Ningaloo Coast	WA	Declared property

National Heritage Places		[Resource Information]
Name	State	Legal Status
Indigenous		
Dampier Archipelago (including Burrup Peninsula)	WA	Listed place
Natural		
The Ningaloo Coast	WA	Listed place

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anous tenuirostris melanops		
Australian Lesser Noddy [26000]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Endangered	Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Malurus leucopterus edouardi White-winged Fairy-wren (Barrow Island), Barrow Island Black-and-white Fairy-wren [26194]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Papasula abbotti Abbott's Booby [59297]	Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Species or species habitat known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area
CRUSTACEAN		
Kumonga exleyi		
Cape Range Remipede [86875]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Milyeringa justitia		
Barrow Cave Gudgeon [86867]	Endangered	Species or species habitat known to occur within area
Milyeringa veritas		
Cape Range Cave Gudgeon, Blind Gudgeon [66676]	Vulnerable	Species or species habitat known to occur within area
Ophisternon candidum		
Blind Cave Eel [66678]	Vulnerable	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera musculus Blue Whale [36]	Endangered	Migration route known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Bettongia lesueur Barrow and Boodie Islands subspecies Boodie, Burrowing Bettong (Barrow and Boodie Islands) [88021]	Vulnerable	Species or species habitat known to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Isoodon auratus barrowensis Golden Bandicoot (Barrow Island) [66666]	Vulnerable	Species or species habitat known to occur within area
Lagorchestes conspicillatus conspicillatus Spectacled Hare-wallaby (Barrow Island) [66661]	Vulnerable	Species or species habitat known to occur within area
Lagorchestes hirsutus Central Australian subspecies Mala, Rufous Hare-Wallaby (Central Australia) [88019]	Endangered	Translocated population known to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Osphranter robustus isabellinus Barrow Island Wallaroo, Barrow Island Euro [89262]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Petrogale lateralis lateralis Black-flanked Rock-wallaby, Moororong, Black-footed Rock Wallaby [66647]	Endangered	Species or species habitat known to occur within area
Rhinonicteris aurantia (Pilbara form) Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat known to occur within area
Sousa sahulensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Aipysurus apraefrontalis Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus foliosquama Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Ctenotus zastictus Hamelin Ctenotus [25570]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Liasis olivaceus barroni Pilbara Olive Python [66699]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
SHARK		
Carcharias taurus (west coast population)		
Grey Nurse Shark (west coast population) [68752]	Vulnerable	Congregation or aggregation known to occur within area
Carcharodon carcharias		
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Centrophorus uyato		
Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Pristis clavata		
Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis		
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat likely to occur within area
Pristis zijsron		
Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sphyrna lewini		
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
[Phaethon lepturus](#) White-tailed Tropicbird [1014]		Species or species habitat known to occur within area
[Sterna dougallii](#) Roseate Tern [817]		Breeding known to occur within area
[Sternula albifrons](#) Little Tern [82849]	Vulnerable	Breeding known to occur within area
[Sula leucogaster](#) Brown Booby [1022]		Breeding known to occur within area
[Thalassarche carteri](#) Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area
[Thalassarche cauta](#) Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
[Thalassarche impavida](#) Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
[Anoxypristis cuspidata](#) Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat known to occur within area
[Balaenoptera bonaerensis](#) Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Migration route known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat likely to occur within area
Carcharias taurus Grey Nurse Shark [64469]		Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Dugong dugon Dugong [28]		Breeding known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Species or species habitat known to occur within area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat likely to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Tringa nebularia		
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50129]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50128]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50127]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50125]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50124]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50126]	WA
Defence - EXMOUTH VLF TRANSMITTER STATION [50122]	WA
Defence - EXMOUTH VLF TRANSMITTER STATION [50123]	WA
Defence - LEARMONTH - AIR WEAPONS RANGE [50193]	WA
Defence - LEARMONTH RADAR SITE - VLAMING HEAD EXMOUTH [50001]	WA
Unknown	
Commonwealth Land - [52236]	WA

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Natural		
Learmonth Air Weapons Range Facility	WA	Listed place
Ningaloo Marine Area - Commonwealth Waters	WA	Listed place

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text

Scientific Name	Threatened Category	Presence Text
Bird		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area
[Anous stolidus](#) Common Noddy [825]		Species or species habitat likely to occur within area
[Anous tenuirostris melanops](#) Australian Lesser Noddy [26000]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
[Ardenna carneipes as Puffinus carneipes](#) Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
[Ardenna pacifica as Puffinus pacificus](#) Wedge-tailed Shearwater [84292]		Breeding known to occur within area
[Bubulcus ibis as Ardea ibis](#) Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat likely to occur within area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Breeding known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Papasula abbotti Abbott's Booby [59297]	Endangered	Species or species habitat may occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area
Pterodroma macroptera Great-winged Petrel [1035]		Foraging, feeding or related behaviour known to occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Rostratula australis as Rostratula benghalensis (sensu lato)		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua		
Brown Skua [85039]		Species or species habitat may occur within area
Sterna dougallii		
Roseate Tern [817]		Breeding known to occur within area
Sternula albifrons as Sterna albifrons		
Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis as Sterna nereis		
Fairy Tern [82949]		Breeding known to occur within area
Sula leucogaster		
Brown Booby [1022]		Breeding known to occur within area
Thalassarche carteri		
Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta		
Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi		
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Thalasseus bengalensis as Sterna bengalensis		
Lesser Crested Tern [66546]		Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
[Thalasseus bergii as Sterna bergii](#) Greater Crested Tern [83000]		Breeding known to occur within area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area
Fish		
[Acentronura larsonae](#) Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area
[Bulbonaricus brauni](#) Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
[Campichthys galei](#) Gale's Pipefish [66191]		Species or species habitat may occur within area
[Campichthys tricarinatus](#) Three-keel Pipefish [66192]		Species or species habitat may occur within area
[Choeroichthys brachysoma](#) Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
[Choeroichthys latispinosus](#) Muiron Island Pipefish [66196]		Species or species habitat may occur within area
[Choeroichthys suillus](#) Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
[Corythoichthys flavofasciatus](#) Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
[Cosmocampus banneri](#) Roughridge Pipefish [66206]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus multiannulatus Many-banded Pipefish [66717]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus spinosissimus Hedgehog Seahorse [66239]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phoxocampus belcheri Black Rock Pipefish [66719]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Mammal		
Dugong dugon Dugong [28]		Breeding known to occur within area
Reptile		
Aipysurus apraefrontalis Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus duboisii Dubois' Sea Snake, Dubois' Seasnake, Reef Shallows Sea Snake [1116]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Aipysurus foliosquama Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus laevis Olive Sea Snake, Olive-brown Sea Snake [1120]		Species or species habitat may occur within area
Aipysurus mosaicus as Aipysurus eydouxii Mosaic Sea Snake [87261]		Species or species habitat may occur within area
Aipysurus pooleorum Shark Bay Sea Snake [66061]		Species or species habitat may occur within area
Aipysurus tenuis Brown-lined Sea Snake, Mjoberg's Sea Snake [1121]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Emydocephalus annulatus Eastern Turtle-headed Sea Snake [1125]		Species or species habitat may occur within area
Ephalophis greyae as Ephalophis greyi Mangrove Sea Snake [93738]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Hydrelaps darwiniensis Port Darwin Sea Snake, Black-ringed Mangrove Sea Snake [1100]		Species or species habitat may occur within area
Hydrophis czeblukovi Fine-spined Sea Snake [59233]		Species or species habitat may occur within area
Hydrophis elegans Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area
Hydrophis kingii as Disteira kingii Spectacled Sea Snake [93511]		Species or species habitat may occur within area
Hydrophis macdowelli as Hydrophis mcdowelli MacDowell's Sea Snake, Small-headed Sea Snake, [75601]		Species or species habitat may occur within area
Hydrophis major as Disteira major Olive-headed Sea Snake [93512]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Sea Snake, Ornate Reef Sea Snake [1111]		Species or species habitat may occur within area
Hydrophis peronii as Acalyptophis peronii Horned Sea Snake [93509]		Species or species habitat may occur within area
Hydrophis platura as Pelamis platurus Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area

Whales and Other Cetaceans		[Resource Information]
Current Scientific Name	Status	Type of Presence
Mammal		

Current Scientific Name	Status	Type of Presence
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Migration route known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Indopacetus pacificus Longman's Beaked Whale [72]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia sima Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
Lagenodelphis hosei Fraser's Dolphin, Sarawak Dolphin [41]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon ginkgodens Gingko-toothed Beaked Whale, Gingko-toothed Whale, Gingko Beaked Whale [59564]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Sousa sahulensis Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area
Stenella longirostris Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops aduncus (Arafura/Timor Sea populations) Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks	[Resource Information]
Park Name	Zone & IUCN Categories
Dampier	Habitat Protection Zone (IUCN IV)
Gascoyne	Habitat Protection Zone (IUCN IV)
Abrolhos	Multiple Use Zone (IUCN VI)
Abrolhos	Multiple Use Zone (IUCN VI)
Dampier	Multiple Use Zone (IUCN VI)
Eighty Mile Beach	Multiple Use Zone (IUCN VI)
Gascoyne	Multiple Use Zone (IUCN VI)
Montebello	Multiple Use Zone (IUCN VI)
Shark Bay	Multiple Use Zone (IUCN VI)
Abrolhos	National Park Zone (IUCN II)
Dampier	National Park Zone (IUCN II)
Gascoyne	National Park Zone (IUCN II)
Ningaloo	National Park Zone (IUCN II)
Ningaloo	Recreational Use Zone (IUCN IV)

Park Name	Zone & IUCN Categories
Ningaloo	Recreational Use Zone (IUCN IV)

Habitat Critical to the Survival of Marine Turtles		[Resource Information]
Scientific Name	Behaviour	Presence
All year (Jun - Aug)		
Natator depressus		
Flatback Turtle [59257]	Nesting	Known to occur
Nov-Feb		
Caretta caretta		
Loggerhead Turtle [1763]	Nesting	Known to occur
Oct - Feb		
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Nesting	Known to occur
Oct - Mar		
Chelonia mydas		
Green Turtle [1765]	Nesting	Known to occur

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Airlie Island	Nature Reserve	WA
Barrow Island	Nature Reserve	WA
Barrow Island	Marine Park	WA
Barrow Island	Marine Management Area	WA
Bessieres Island	Nature Reserve	WA
Boodie, Double Middle Islands	Nature Reserve	WA
Bundegi Coastal Park	5(1)(h) Reserve	WA
Cape Range	National Park	WA
Cape Range (South)	National Park	WA
Great Sandy Island	Nature Reserve	WA
Great Sandy Island	Nature Reserve	WA

Protected Area Name	Reserve Type	State
Jurabi Coastal Park	5(1)(h) Reserve	WA
Little Rocky Island	Nature Reserve	WA
Lowendal Islands	Nature Reserve	WA
Montebello Islands	Conservation Park	WA
Montebello Islands	Conservation Park	WA
Montebello Islands	Marine Park	WA
Muiron Islands	Nature Reserve	WA
Muiron Islands	Marine Management Area	WA
Ningaloo	Marine Park	WA
North Sandy Island	Nature Reserve	WA
Round Island	Nature Reserve	WA
Serrurier Island	Nature Reserve	WA
Thevenard Island	Nature Reserve	WA
Thevenard Island	Nature Reserve	WA
Unnamed WA36909	5(1)(h) Reserve	WA
Unnamed WA36910	5(1)(h) Reserve	WA
Unnamed WA36913	Nature Reserve	WA
Unnamed WA36915	Nature Reserve	WA
Unnamed WA40322	5(1)(h) Reserve	WA
Unnamed WA40877	5(1)(h) Reserve	WA
Unnamed WA44665	5(1)(h) Reserve	WA
Unnamed WA44667	5(1)(h) Reserve	WA

Nationally Important Wetlands

[Resource Information]

Wetland Name	State
Cape Range Subterranean Waterways	WA

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status

Title of referral	Reference	Referral Outcome	Assessment Status
3D Seismic Survey in the Carnarvon Bsin on the North West Shelf	2002/778		Completed
Babylon 3D Marine Seismic Survey, Commonwealth Waters, nr Exmouth WA	2013/7081		Completed
Browse to North West Shelf Development, Indian Ocean, WA	2018/8319		Approval
DAVROS MC 3D marine seismic survey northwaet of Dampier, WA	2013/7092		Completed
Deep Water Northwest Shelf 2D Seismic Survey	2007/3260		Completed
Development of Mutineer and Exeter petroleum fields for oil production, Permit	2003/1033		Completed
Gorgon Gas Development	2003/1294		Post-Approval
Ningaloo Lighthouse Development, 17km north west Exmouth, Western Australia	2020/8693		Post-Approval
North West Shelf Project Extension, Carnarvon Basin, WA	2018/8335		Approval
Offshore Dredge Spoil Disposal - Mardie Project	2024/10054		Referral Decision
Project Highclere Cable Lay and Operation	2022/09203		Completed
Action clearly unacceptable			
Highlands 3D Marine Seismic Survey	2012/6680	Action Clearly Unacceptable	Completed
Controlled action			
'Van Gogh' Petroleum Field Development	2007/3213	Controlled Action	Post-Approval
Anketell Point Iron Ore Processing & Export Port	2009/5120	Controlled Action	Post-Approval
Construct and operate LNG & domestic gas plant including onshore and offshore facilities - Wheatston	2008/4469	Controlled Action	Post-Approval
Develop Jansz-Io deepwater gas field in Permit Areas WA-18-R, WA-25-R and WA-26-	2005/2184	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Development of Angel gas and condensate field, North West Shelf	2004/1805	Controlled Action	Post-Approval
Development of Browse Basin Gas Fields (Upstream)	2008/4111	Controlled Action	Completed
Development of Coniston/Novara fields within the Exmouth Sub-basin	2011/5995	Controlled Action	Post-Approval
Development of Stybarrow petroleum field incl drilling and facility installation	2004/1469	Controlled Action	Post-Approval
Echo-Yodel Production Wells	2000/11	Controlled Action	Post-Approval
Enfield full field development	2001/257	Controlled Action	Post-Approval
Equus Gas Fields Development Project, Carnarvon Basin	2012/6301	Controlled Action	Completed
Eramurra Industrial Salt Project	2021/9027	Controlled Action	Assessment Approach
Eramurra Industrial Salt Project, near Karratha, WA	2019/8448	Controlled Action	Completed
Gorgon Gas Development 4th Train Proposal	2011/5942	Controlled Action	Post-Approval
Gorgon Gas Revised Development	2008/4178	Controlled Action	Post-Approval
Greater Enfield (Vincent) Development	2005/2110	Controlled Action	Post-Approval
Greater Gorgon Development - Optical Fibre Cable, Mainland to Barrow Island	2005/2141	Controlled Action	Completed
Light Crude Oil Production	2001/365	Controlled Action	Post-Approval
Mardie Project, 80 km south west of Karratha, WA	2018/8236	Controlled Action	Post-Approval
Nava-1 Cable System	2001/510	Controlled Action	Completed
Pluto Gas Project	2005/2258	Controlled Action	Completed
Pluto Gas Project Including Site B	2006/2968	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Pyrenees Oil Fields Development	2005/2034	Controlled Action	Post-Approval
Simpson Development	2000/59	Controlled Action	Completed
Simpson Oil Field Development	2001/227	Controlled Action	Post-Approval
Vincent Appraisal Well	2000/22	Controlled Action	Post-Approval
Yardie Creek Road Realignment Project	2021/8967	Controlled Action	Assessment Approach
Not controlled action			
'Goodwyn A' Low Pressure Train Project	2003/914	Not Controlled Action	Completed
'Van Gogh' Oil Appraisal Drilling Program, Exploration Permit Area WA-155-P(1)	2006/3148	Not Controlled Action	Completed
Airlie Island soil and groundwater investigations, Exmouth Gulf, offshore Pilbara coast	2014/7250	Not Controlled Action	Completed
APX-West Fibre-optic telecommunications cable system, WA to Singapore	2013/7102	Not Controlled Action	Completed
Barrow Island 2D Seismic survey	2006/2667	Not Controlled Action	Completed
Bollinger 2D Seismic Survey 200km North of North West Cape WA	2004/1868	Not Controlled Action	Completed
Bultaco-2, Laverda-2, Laverda-3 and Montesa-2 Appraisal Wells	2000/103	Not Controlled Action	Completed
Carnarvon 3D Marine Seismic Survey	2004/1890	Not Controlled Action	Completed
Cazadores 2D seismic survey	2004/1720	Not Controlled Action	Completed
Construction and operation of an unmanned sea platform and connecting pipeline to Varanus Island for	2004/1703	Not Controlled Action	Completed
Controlled Source Electromagnetic Survey	2007/3262	Not Controlled Action	Completed
Development of Halyard Field off the west coast of WA	2010/5611	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Development of iron ore facilities	2013/7013	Not Controlled Action	Completed
Differential Global Positioning System (DGPS)	2001/445	Not Controlled Action	Completed
Drilling of an exploration well Gats-1 in Permit Area WA-261-P	2004/1701	Not Controlled Action	Completed
Eagle-1 Exploration Drilling, North West Shelf, WA	2019/8578	Not Controlled Action	Completed
Echo A Development WA-23-L, WA-24-L	2005/2042	Not Controlled Action	Completed
Exploration drilling well WA-155-P(1)	2003/971	Not Controlled Action	Completed
Exploration of appraisal wells	2006/3065	Not Controlled Action	Completed
Exploration Well (Taunton-2)	2002/731	Not Controlled Action	Completed
Exploration Well in Permit Area WA-155-P(1)	2002/759	Not Controlled Action	Completed
Exploratory drilling in permit area WA-225-P	2001/490	Not Controlled Action	Completed
Extension of Simpson Oil Platforms & Wells	2002/685	Not Controlled Action	Completed
HCA05X Macedon Experimental Survey	2004/1926	Not Controlled Action	Completed
Hess Exploration Drilling Programme	2007/3566	Not Controlled Action	Completed
Huascaran-1 exploration well (WA-292-P)	2001/539	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO West Submarine Telecommunications Cable, WA	2017/8126	Not Controlled Action	Completed
Infill Production Well (Griffin-9)	2001/417	Not Controlled Action	Completed
Jansz-2 and 3 Appraisal Wells	2002/754	Not Controlled Action	Completed
Klammer 2D Seismic Survey	2002/868	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Maia-Gaea Exploration wells	2000/17	Not Controlled Action	Completed
Manaslu - 1 and Huascaran - 1 Offshore Exploration Wells	2001/235	Not Controlled Action	Completed
Mermaid Marine Australia Desalination Project	2011/5916	Not Controlled Action	Completed
Montesa-1 and Bultaco-1 Exploration Wells	2000/102	Not Controlled Action	Completed
Murujuga archaeological excavation, collection and sampling, Dampier Archipelago, WA	2014/7160	Not Controlled Action	Completed
North Rankin B gas compression facility	2005/2500	Not Controlled Action	Completed
Pipeline System Modifications Project	2000/3	Not Controlled Action	Completed
Project Highclere Geophysical Survey	2021/9023	Not Controlled Action	Completed
Searipple gas and condensate field development	2000/89	Not Controlled Action	Completed
Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin	2004/1700	Not Controlled Action	Completed
Spool Base Facility	2001/263	Not Controlled Action	Completed
Subsea Gas Pipeline From Stybarrow Field to Griffin Venture Gas Export Pipeline	2005/2033	Not Controlled Action	Completed
sub-sea tieback of Perseus field wells	2004/1326	Not Controlled Action	Completed
Telstra North Rankin Spur Fibre Optic Cable	2016/7836	Not Controlled Action	Completed
Thevenard Island Retirement Project	2015/7423	Not Controlled Action	Completed
To construct and operate an offshore submarine fibre optic cable, WA	2014/7373	Not Controlled Action	Completed
Wanda Offshore Research Project, 80 km north-east of Exmouth, WA	2018/8293	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Western Flank Gas Development	2005/2464	Not Controlled Action	Completed
Wheatstone 3D seismic survey, 70km north of Barrow Island	2004/1761	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Kate' 3D marine seismic survey, exploration permits WA-320-P and WA-345-P, 60km	2005/2037	Not Controlled Action (Particular Manner)	Post-Approval
'Tourmaline' 2D marine seismic survey, permit areas WA-323-P, WA-330-P and WA-32	2005/2282	Not Controlled Action (Particular Manner)	Post-Approval
"Leanne" offshore 3D seismic exploration, WA-356-P	2005/1938	Not Controlled Action (Particular Manner)	Post-Approval
2D and 3D seismic surveys	2005/2151	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey	2008/4493	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2005/2146	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Permit Area WA-352-P	2008/4628	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey within permit WA-291	2007/3265	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey	2008/4281	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey (WA-482-P, WA-363-P), WA	2013/6761	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
3D Marine Seismic Survey in Permit Areas WA-15-R, WA-18-R, WA-205-P, WA-253-P, WA-267-P and WA-268-P	2003/1271	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey in WA 457-P & WA 458-P, North West Shelf, offshore WA	2013/6862	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey over petroleum title WA-268-P	2007/3458	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Surveys - Contos CT-13 & Supertubes CT-13, offshore WA	2013/6901	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic survey	2006/2715	Not Controlled Action (Particular Manner)	Post-Approval
3D Seismic Survey, WA	2008/4428	Not Controlled Action (Particular Manner)	Post-Approval
3D sesmic survey	2006/2781	Not Controlled Action (Particular Manner)	Post-Approval
Acheron Non-Exclusive 2D Seismic Survey	2009/4968	Not Controlled Action (Particular Manner)	Post-Approval
Acheron Non-Exclusive 2D Seismic Survey	2008/4565	Not Controlled Action (Particular Manner)	Post-Approval
Apache Northwest Shelf Van Gogh Field Appraisal Drilling Program	2007/3495	Not Controlled Action (Particular Manner)	Post-Approval
Aperio 3D Marine Seismic Survey, WA	2012/6648	Not Controlled Action (Particular Manner)	Post-Approval
Artemis-1 Drilling Program (WA-360-P)	2010/5432	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Australia to Singapore Fibre Optic Submarine Cable System	2011/6127	Not Controlled Action (Particular Manner)	Post-Approval
Balnaves Condensate Field Development	2011/6188	Not Controlled Action (Particular Manner)	Post-Approval
Cable Seismic Exploration Permit areas WA-323-P and WA-330-P	2008/4227	Not Controlled Action (Particular Manner)	Post-Approval
Cerberus exploration drilling campaign, Carnarvon Basin, WA	2016/7645	Not Controlled Action (Particular Manner)	Post-Approval
CGGVERITAS 2010 2D Seismic Survey	2010/5714	Not Controlled Action (Particular Manner)	Post-Approval
Charon 3D Marine Seismic Survey	2007/3477	Not Controlled Action (Particular Manner)	Post-Approval
Consturction & operation of the Varanus Island kitchen & mess cyclone refuge building, compression p	2013/6952	Not Controlled Action (Particular Manner)	Post-Approval
Coverack Marine Seismic Survey	2001/399	Not Controlled Action (Particular Manner)	Post-Approval
Cue Seismic Survey within WA-359-P, WA-361-P and WA-360-P	2007/3647	Not Controlled Action (Particular Manner)	Post-Approval
CVG 3D Marine Seismic Survey	2012/6654	Not Controlled Action (Particular Manner)	Post-Approval
Decommissioning of the Legendre facilities	2010/5681	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Deep Water Drilling Program	2010/5532	Not Controlled Action (Particular Manner)	Post-Approval
Demeter 3D Seismic Survey, off Dampier, WA	2002/900	Not Controlled Action (Particular Manner)	Post-Approval
Diesel Fuel Bunker Operation	2012/6289	Not Controlled Action (Particular Manner)	Post-Approval
Draeck 3D Marine Seismic Survey, WA-205-P	2006/3067	Not Controlled Action (Particular Manner)	Post-Approval
Drilling 35-40 offshore exploration wells in deep water	2008/4461	Not Controlled Action (Particular Manner)	Post-Approval
Earthworks for kitchen/mess, cyclone refuge building & Compression Plant, Varanus Island	2013/6900	Not Controlled Action (Particular Manner)	Post-Approval
Eendracht Multi-Client 3D Marine Seismic Survey	2009/4749	Not Controlled Action (Particular Manner)	Post-Approval
Effect of marine seismic sounds to demersal fish and pearl oysters, north-west WA	2018/8169	Not Controlled Action (Particular Manner)	Post-Approval
Enfield M3 & Vincent 4D Marine Seismic Surveys	2008/3981	Not Controlled Action (Particular Manner)	Completed
Enfield M3 4D, Vincent 4D & 4D Line Test Marine Seismic Surveys	2008/4122	Not Controlled Action (Particular Manner)	Post-Approval
Enfield M4 4D Marine Seismic Survey	2008/4558	Not Controlled Action (Particular Manner)	Post-Approval
Enfield oilfield 3D Seismic Survey	2006/3132	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Exmouth West 2D Marine Seismic Survey	2008/4132	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of Zeus-1 well	2008/4351	Not Controlled Action (Particular Manner)	Post-Approval
Fletcher-Finucane Development, WA26-L and WA191-P	2011/6123	Not Controlled Action (Particular Manner)	Post-Approval
Foxhound 3D Non-Exclusive Marine Seismic Survey	2009/4703	Not Controlled Action (Particular Manner)	Post-Approval
Gazelle 3D Marine Seismic Survey in WA-399-P and WA-42-L	2010/5570	Not Controlled Action (Particular Manner)	Post-Approval
Geco Eagle 3D Marine Seismic Survey	2008/3958	Not Controlled Action (Particular Manner)	Post-Approval
Glencoe 3D Marine Seismic Survey WA-390-P	2007/3684	Not Controlled Action (Particular Manner)	Post-Approval
Greater Western Flank Phase 1 gas Development	2011/5980	Not Controlled Action (Particular Manner)	Post-Approval
Grimalkin 3D Seismic Survey	2008/4523	Not Controlled Action (Particular Manner)	Post-Approval
Guacamole 2D Marine Seismic Survey	2008/4381	Not Controlled Action (Particular Manner)	Post-Approval
Harmony 3D Marine Seismic Survey	2012/6699	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Harpy 1 exploration well	2001/183	Not Controlled Action (Particular Manner)	Post-Approval
Huzzas MC3D Marine Seismic Survey (HZ-13) Carnarvon Basin, offshore WA	2013/7003	Not Controlled Action (Particular Manner)	Post-Approval
Huzzas phase 2 marine seismic survey, Exmouth Plateau, Northern Carnarvon Basin, WA	2013/7093	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
John Ross & Rosella Off Bottom Cable Seismic Exploration Program	2008/3966	Not Controlled Action (Particular Manner)	Post-Approval
Judo Marine 3D Seismic Survey within and adjacent to WA-412-P	2008/4630	Not Controlled Action (Particular Manner)	Post-Approval
Judo Marine 3D Seismic Survey within and adjacent to WA-412-P	2009/4801	Not Controlled Action (Particular Manner)	Post-Approval
Julimar Brunello Gas Development Project	2011/5936	Not Controlled Action (Particular Manner)	Post-Approval
Klimt 2D Marine Seismic Survey	2007/3856	Not Controlled Action (Particular Manner)	Post-Approval
Laverda 3D Marine Seismic Survey and Vincent M1 4D Marine Seismic Survey	2010/5415	Not Controlled Action (Particular Manner)	Post-Approval
Laying a submarine optical fibre telecommunications cable, Perth to Singapore and Jakarta	2014/7332	Not Controlled Action (Particular Manner)	Post-Approval
Leopard 2D marine seismic survey	2005/2290	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Lion 2D Marine Seismic Survey	2007/3777	Not Controlled Action (Particular Manner)	Post-Approval
Macedon Gas Field Development	2008/4605	Not Controlled Action (Particular Manner)	Post-Approval
Marine reconnaissance survey	2008/4466	Not Controlled Action (Particular Manner)	Post-Approval
Moosehead 2D seismic survey within permit WA-192-P	2005/2167	Not Controlled Action (Particular Manner)	Post-Approval
Munmorah 2D seismic survey within permits WA-308/9-P	2003/970	Not Controlled Action (Particular Manner)	Post-Approval
Ocean Bottom Cable Seismic Program, WA-264-P	2007/3844	Not Controlled Action (Particular Manner)	Post-Approval
Ocean Bottom Cable Seismic Survey	2005/2017	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Canning Multi Client 2D Marine Seismic Survey	2010/5393	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Drilling Campaign	2011/5830	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Fibre Optic Cable Network Construction & Operation, Port Hedland WA to Darwin NT	2014/7223	Not Controlled Action (Particular Manner)	Post-Approval
Orcus 3D Marine Seismic Survey in WA-450-P	2010/5723	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Osprey and Dionysus Marine Seismic Survey	2011/6215	Not Controlled Action (Particular Manner)	Post-Approval
Palta-1 exploration well in Petroleum Permit Area WA-384-P	2011/5871	Not Controlled Action (Particular Manner)	Post-Approval
Phoenix 3D Seismic Survey, Bedout Sub-Basin	2010/5360	Not Controlled Action (Particular Manner)	Post-Approval
Pomodoro 3D Marine Seismic Survey in WA-426-P and WA-427-P	2010/5472	Not Controlled Action (Particular Manner)	Post-Approval
Port Walcott upgrade, dredging & spoil disposal, & channel realignment	2006/2806	Not Controlled Action (Particular Manner)	Post-Approval
Pyrenees 4D Marine Seismic Monitor Survey, HCA12A	2012/6579	Not Controlled Action (Particular Manner)	Post-Approval
Pyrenees-Macedon 3D marine seismic survey	2005/2325	Not Controlled Action (Particular Manner)	Post-Approval
Quiberon 2D Seismic Survey, permit area WA-385P, offshore of Carnarvon	2009/5077	Not Controlled Action (Particular Manner)	Post-Approval
Reindeer gas reservior development, Devil Creek, Carnarvon Basin - WA	2007/3917	Not Controlled Action (Particular Manner)	Post-Approval
Rose 3D Seismic Program	2008/4239	Not Controlled Action (Particular Manner)	Post-Approval
Rydal-1 Petroleum Exploration Well, WA	2012/6522	Not Controlled Action (Particular Manner)	Post-Approval
Salsa 3D Marine Seismic Survey	2010/5629	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Santos Winchester three dimensional seismic survey - WA-323-P & WA-330-P	2011/6107	Not Controlled Action (Particular Manner)	Post-Approval
Scarborough Development nearshore component, NWS, WA	2018/8362	Not Controlled Action (Particular Manner)	Post-Approval
Skorpion Marine Seismic Survey WA	2001/416	Not Controlled Action (Particular Manner)	Post-Approval
Stag 4D & Reindeer MAZ Marine Seismic Surveys, WA	2013/7080	Not Controlled Action (Particular Manner)	Post-Approval
Stag Off-bottom Cable Seismic Survey	2007/3696	Not Controlled Action (Particular Manner)	Post-Approval
Stybarrow 4D Marine Seismic Survey	2011/5810	Not Controlled Action (Particular Manner)	Post-Approval
Stybarrow Baseline 4D marine seismic survey	2008/4530	Not Controlled Action (Particular Manner)	Post-Approval
Tantabiddi Boat Ramp Sand Bypassing	2015/7411	Not Controlled Action (Particular Manner)	Post-Approval
Tidepole Maz 3D Seismic Survey Campaign	2007/3706	Not Controlled Action (Particular Manner)	Post-Approval
Tortilla 2D Seismic Survey, WA	2011/6110	Not Controlled Action (Particular Manner)	Post-Approval
Triton 3D Marine Seismic Survey, WA-2-R and WA-3-R	2006/2609	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Undertake a 3D marine seismic survey	2010/5695	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5679	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5715	Not Controlled Action (Particular Manner)	Post-Approval
Vincent M1 and Enfield M5 4D Marine Seismic Survey	2010/5720	Not Controlled Action (Particular Manner)	Post-Approval
Warramunga Non-Inclusive 3D Seismic Survey	2008/4553	Not Controlled Action (Particular Manner)	Post-Approval
West Anchor 3D Marine Seismic Survey	2008/4507	Not Controlled Action (Particular Manner)	Post-Approval
West Panaeus 3D seismic survey	2006/3141	Not Controlled Action (Particular Manner)	Post-Approval
Westralia SPAN Marine Seismic Survey, WA & NT	2012/6463	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone 3D MAZ Marine Seismic Survey	2011/6058	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone Iago Appraisal Well Drilling	2008/4134	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone Iago Appraisal Well Drilling	2007/3941	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			
3D Marine Seismic Survey in the offshore northwest Carnarvon	2011/6175	Referral Decision	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
Basin			
3D Seismic Survey	2008/4219	Referral Decision	Completed
Bianchi 3D Marine Seismic Survey, Carnavon Basin, WA	2013/7078	Referral Decision	Completed
CVG 3D Marine Seismic Survey	2012/6270	Referral Decision	Completed
Enfield 4D Marine Seismic Surveys, Production Permit WA-28-L	2005/2370	Referral Decision	Completed
Rose 3D Seismic acquisition survey	2008/4220	Referral Decision	Completed
Stybarrow Baseline 4D Marine Seismic Survey (Permit Areas WA-255-P, WA-32-L, WA-	2008/4165	Referral Decision	Completed
Two Dimensional Transition Zone Seismic Survey - TP/7 (R1)	2010/5507	Referral Decision	Completed
Varanus Island Compression Project	2012/6698	Referral Decision	Completed

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Ancient coastline at 125 m depth contour	North-west
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	North-west
Commonwealth waters adjacent to Ningaloo Reef	North-west
Continental Slope Demersal Fish Communities	North-west
Exmouth Plateau	North-west
Glomar Shoals	North-west
Perth Canyon and adjacent shelf break, and other west coast canyons	South-west
Western demersal slope and associated fish communities	South-west

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence

Scientific Name	Behaviour	Presence
Dugong		
Dugong dugon Dugong [28]	Breeding	Known to occur
Dugong dugon Dugong [28]	Calving	Known to occur
Dugong dugon Dugong [28]	Foraging (high density seagrass beds)	Known to occur
Dugong dugon Dugong [28]	Nursing	Known to occur
Marine Turtles		
Caretta caretta Loggerhead Turtle [1763]	Foraging	Known to occur
Caretta caretta Loggerhead Turtle [1763]	Internesting buffer	Known to occur
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur
Chelonia mydas Green Turtle [1765]	Aggregation	Known to occur
Chelonia mydas Green Turtle [1765]	Basking	Known to occur
Chelonia mydas Green Turtle [1765]	Foraging	Known to occur
Chelonia mydas Green Turtle [1765]	Internesting	Known to occur
Chelonia mydas Green Turtle [1765]	Internesting buffer	Known to occur
Chelonia mydas Green Turtle [1765]	Mating	Known to occur

Scientific Name	Behaviour	Presence
Chelonia mydas Green Turtle [1765]	Migration corridor	Known to occur
Chelonia mydas Green Turtle [1765]	Nesting	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Foraging	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Internesting	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Internesting buffer	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Mating	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Migration corridor	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Nesting	Known to occur
Natator depressus Flatback Turtle [59257]	Aggregation	Known to occur
Natator depressus Flatback Turtle [59257]	Foraging	Known to occur
Natator depressus Flatback Turtle [59257]	Internesting	Known to occur
Natator depressus Flatback Turtle [59257]	Internesting buffer	Known to occur
Natator depressus Flatback Turtle [59257]	Mating	Known to occur
Natator depressus Flatback Turtle [59257]	Migration corridor	Known to occur

Scientific Name	Behaviour	Presence
Natator depressus Flatback Turtle [59257]	Nesting	Known to occur
Seabirds		
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [84292]	Breeding	Known to occur
Fregata ariel Lesser Frigatebird [1012]	Breeding	Known to occur
Onychoprion anaethetus Bridled Tern [82845]	Foraging (in high numbers)	Known to occur
Onychoprion fuscata Sooty Tern [82847]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging (in high numbers)	Known to occur
Puffinus assimilis tunneyi Little Shearwater [59363]	Foraging (in high numbers)	Known to occur
Sterna dougallii Roseate Tern [817]	Breeding	Known to occur
Sternula nereis Fairy Tern [82949]	Breeding	Known to occur
Sula leucogaster Brown Booby [1022]	Breeding	Known to occur
Thalasseus bengalensis Lesser Crested Tern [66546]	Breeding	Known to occur
Sharks		
Rhincodon typus Whale Shark [66680]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Rhincodon typus Whale Shark [66680]	Foraging (high density prey)	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Migration	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Resting	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 02-Apr-2025

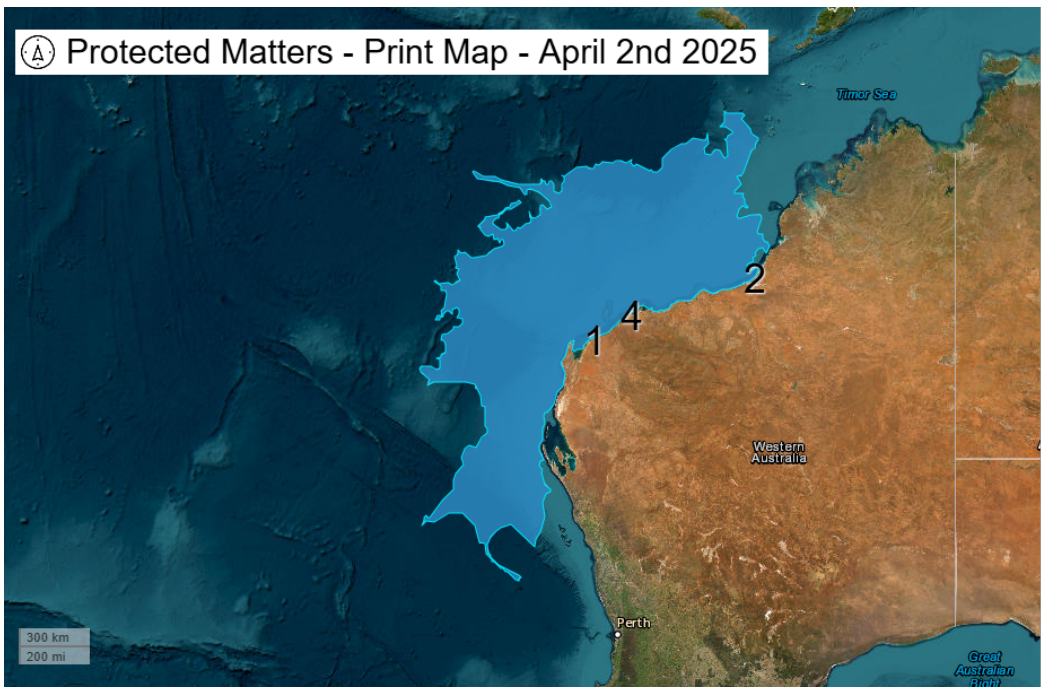

Figure 1: Environment that may be affected

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	2
National Heritage Places:	6
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	7
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	90
Listed Migratory Species:	98

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	120
Commonwealth Heritage Places:	4
Listed Marine Species:	168
Whales and Other Cetaceans:	39
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	29
Habitat Critical to the Survival of Marine Turtles:	4

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	56
Regional Forest Agreements:	None
Nationally Important Wetlands:	5
EPBC Act Referrals:	293
Key Ecological Features (Marine):	13
Biologically Important Areas:	64
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Legal Status
Shark Bay, Western Australia	WA	Declared property
The Ningaloo Coast	WA	Declared property

National Heritage Places		[Resource Information]
Name	State	Legal Status
Historic		
HMAS Sydney II and HSK Kormoran Shipwreck Sites	EXT	Listed place
Dirk Hartog Landing Site 1616 - Cape Inscription Area	WA	Listed place
Indigenous		
Dampier Archipelago (including Burrup Peninsula)	WA	Listed place
Natural		
Shark Bay, Western Australia	WA	Listed place
The Ningaloo Coast	WA	Listed place
The West Kimberley	WA	Listed place

Wetlands of International Importance (Ramsar Wetlands)	[Resource Information]
Ramsar Site Name	Proximity
Eighty-mile beach	Within Ramsar site

Commonwealth Marine Area	[Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)
Commonwealth Marine Areas (EPBC Act)

Feature Name
Commonwealth Marine Areas (EPBC Act)

Commonwealth Marine Areas (EPBC Act)

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anous tenuirostris melanops		
Australian Lesser Noddy [26000]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Aphelocephala leucopsis		
Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area
Arenaria interpres		
Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris canutus		
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris		
Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius leschenaultii		
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus		
Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Endangered	Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat likely to occur within area
Malurus leucopterus edouardi White-winged Fairy-wren (Barrow Island), Barrow Island Black-and-white Fairy-wren [26194]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Malurus leucopterus leucopterus White-winged Fairy-wren (Dirk Hartog Island), Dirk Hartog Black-and-White Fairy-wren [26004]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Papasula abbotti Abbott's Booby [59297]	Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area
Phaethon rubricauda westralis Red-tailed Tropicbird (Indian Ocean), Indian Ocean Red-tailed Tropicbird [91824]	Endangered	Breeding known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat may occur within area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Breeding known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area
CRUSTACEAN		
Kumonga exleyi Cape Range Remipede [86875]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Milyeringa justitia Barrow Cave Gudgeon [86867]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Milyeringa veritas		
Cape Range Cave Gudgeon, Blind Gudgeon [66676]	Vulnerable	Species or species habitat known to occur within area
Ophisternon candidum		
Blind Cave Eel [66678]	Vulnerable	Species or species habitat known to occur within area
MAMMAL		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Migration route known to occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Bettongia lesueur Barrow and Boodie Islands subspecies		
Boodie, Burrowing Bettong (Barrow and Boodie Islands) [88021]	Vulnerable	Species or species habitat known to occur within area
Bettongia penicillata ogilbyi		
Woylie [66844]	Endangered	Species or species habitat likely to occur within area
Dasyurus hallucatus		
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Eubalaena australis		
Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Isoodon auratus barrowensis		
Golden Bandicoot (Barrow Island) [66666]	Vulnerable	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Lagorchestes conspicillatus conspicillatus		
Spectacled Hare-wallaby (Barrow Island) [66661]	Vulnerable	Species or species habitat known to occur within area
Lagorchestes hirsutus bernieri		
Rufous Hare-wallaby (Bernier Island) [66662]	Vulnerable	Translocated population known to occur within area
Lagorchestes hirsutus Central Australian subspecies		
Mala, Rufous Hare-Wallaby (Central Australia) [88019]	Endangered	Translocated population known to occur within area
Lagorchestes hirsutus dorreae		
Rufous Hare-wallaby (Dorre Island) [66663]	Vulnerable	Translocated population known to occur within area
Lagostrophus fasciatus fasciatus		
Banded Hare-wallaby, Merrnine, Marnine, Munning [66664]	Vulnerable	Translocated population known to occur within area
Macroderma gigas		
Ghost Bat [174]	Vulnerable	Species or species habitat known to occur within area
Macrotis lagotis		
Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area
Orcaella heinsohni		
Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Osphranter robustus isabellinus		
Barrow Island Wallaroo, Barrow Island Euro [89262]	Vulnerable	Species or species habitat likely to occur within area
Perameles bougainville		
Shark Bay Bandicoot [278]	Endangered	Translocated population known to occur within area
Petrogale lateralis lateralis		
Black-flanked Rock-wallaby, Moororong, Black-footed Rock Wallaby [66647]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Rhinonicteris aurantia (Pilbara form)		
Pilbara Leaf-nosed Bat [82790]	Vulnerable	Species or species habitat known to occur within area
Sousa sahulensis		
Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
Trichosurus vulpecula arnhemensis		
Northern Brushtail Possum [83091]	Vulnerable	Species or species habitat may occur within area
PLANT		
Minuria tridens		
Minnie Daisy [13753]	Vulnerable	Species or species habitat known to occur within area
REPTILE		
Aipysurus apraefrontalis		
Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus foliosquama		
Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Ctenotus zastictus		
Hamelin Ctenotus [25570]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea		
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Egernia stokesii badia		
Western Spiny-tailed Skink, Baudin Island Spiny-tailed Skink [64483]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat likely to occur within area
Lerista nevinae Nevin's Slider [85296]	Endangered	Species or species habitat known to occur within area
Liasis olivaceus barroni Pilbara Olive Python [66699]	Vulnerable	Species or species habitat known to occur within area
Liopholis kintorei Great Desert Skink, Tjakura, Warrarna, Mulyamiji, Tjalapa, Nampu [83160]	Vulnerable	Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Tiliqua scincoides intermedia Northern Blue-tongued Skink [89838]	Critically Endangered	Species or species habitat likely to occur within area
SHARK		
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Centrophorus uyato Little Gulper Shark [68446]	Conservation Dependent	Species or species habitat likely to occur within area
Glyphis garricki Northern River Shark, New Guinea River Shark [82454]	Endangered	Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Pristis pristis		
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron		
Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding known to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sphyrna lewini		
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat known to occur within area

Listed Migratory Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes		
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna pacifica		
Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Calonectris leucomelas		
Streaked Shearwater [1077]		Species or species habitat known to occur within area
Diomedea amsterdamensis		
Amsterdam Albatross [64405]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Breeding known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Hydroprogne caspia Caspian Tern [808]		Breeding known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat likely to occur within area
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Breeding known to occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Breeding known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sterna dougallii Roseate Tern [817]		Breeding known to occur within area
Sternula albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Sula dactylatra Masked Booby [1021]		Breeding known to occur within area
Sula leucogaster Brown Booby [1022]		Breeding known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat known to occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Balaenoptera musculus Blue Whale [36]	Endangered	Migration route known to occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat likely to occur within area
Carcharias taurus Grey Nurse Shark [64469]		Congregation or aggregation known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Dugong dugon Dugong [28]		Breeding known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]		Breeding known to occur within area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcaella heinsohni Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pristis clavata Dwarf Sawfish, Queensland Sawfish [68447]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Pristis pristis		
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron		
Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding known to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Sousa sahulensis as Sousa chinensis		
Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
Tursiops aduncus (Arafura/Timor Sea populations)		
Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Migratory Terrestrial Species		
Cuculus optatus		
Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundo rustica		
Barn Swallow [662]		Species or species habitat known to occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres		
Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area

Scientific Name	Threatened Category	Presence Text
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Glareola maldivarum Oriental Pratincole [840]		Roosting known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area
Tringa totanus Common Redshank, Redshank [835]		Roosting known to occur within area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State
Defence	
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50124]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50126]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50127]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50125]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50129]	WA
Defence - EXMOUTH ADMIN & HF TRANSMITTING [50128]	WA
Defence - EXMOUTH VLF TRANSMITTER STATION [50123]	WA

Commonwealth Land Name	State
Defence - EXMOUTH VLF TRANSMITTER STATION [50122]	WA
Defence - LEARMONTH - AIR WEAPONS RANGE [50193]	WA
Defence - LEARMONTH - RAAF BASE [50107]	WA
Defence - LEARMONTH - RAAF BASE [50100]	WA
Defence - LEARMONTH - RAAF BASE [50106]	WA
Defence - LEARMONTH - RAAF BASE [50109]	WA
Defence - LEARMONTH - RAAF BASE [50108]	WA
Defence - LEARMONTH - RAAF BASE [50103]	WA
Defence - LEARMONTH - RAAF BASE [50101]	WA
Defence - LEARMONTH - RAAF BASE [50097]	WA
Defence - LEARMONTH RADAR SITE - TWIN TANKS EXMOUTH [50002]	WA
Defence - LEARMONTH RADAR SITE - VLAMING HEAD EXMOUTH [50001]	WA
Unknown	
Commonwealth Land - [50977]	WA
Commonwealth Land - [50978]	WA
Commonwealth Land - [51704]	WA
Commonwealth Land - [50976]	WA
Commonwealth Land - [51456]	WA
Commonwealth Land - [51454]	WA
Commonwealth Land - [51451]	WA
Commonwealth Land - [51450]	WA
Commonwealth Land - [51453]	WA
Commonwealth Land - [51452]	WA
Commonwealth Land - [51672]	WA
Commonwealth Land - [51709]	WA
Commonwealth Land - [52101]	WA

Commonwealth Land Name	State
Commonwealth Land - [51670]	WA
Commonwealth Land - [52110]	WA
Commonwealth Land - [51703]	WA
Commonwealth Land - [51700]	WA
Commonwealth Land - [51706]	WA
Commonwealth Land - [51705]	WA
Commonwealth Land - [51708]	WA
Commonwealth Land - [51444]	WA
Commonwealth Land - [51445]	WA
Commonwealth Land - [51448]	WA
Commonwealth Land - [51707]	WA
Commonwealth Land - [50385]	WA
Commonwealth Land - [51442]	WA
Commonwealth Land - [51699]	WA
Commonwealth Land - [51449]	WA
Commonwealth Land - [51695]	WA
Commonwealth Land - [51698]	WA
Commonwealth Land - [51447]	WA
Commonwealth Land - [51446]	WA
Commonwealth Land - [51443]	WA
Commonwealth Land - [52195]	WA
Commonwealth Land - [51477]	WA
Commonwealth Land - [51054]	WA
Commonwealth Land - [51055]	WA
Commonwealth Land - [51716]	WA
Commonwealth Land - [52236]	WA
Commonwealth Land - [51458]	WA

Commonwealth Land Name	State
Commonwealth Land - [51459]	WA
Commonwealth Land - [51053]	WA
Commonwealth Land - [51671]	WA
Commonwealth Land - [51460]	WA
Commonwealth Land - [51467]	WA
Commonwealth Land - [51466]	WA
Commonwealth Land - [51465]	WA
Commonwealth Land - [51461]	WA
Commonwealth Land - [51475]	WA
Commonwealth Land - [51464]	WA
Commonwealth Land - [51469]	WA
Commonwealth Land - [51468]	WA
Commonwealth Land - [51470]	WA
Commonwealth Land - [52098]	WA
Commonwealth Land - [51884]	WA
Commonwealth Land - [52097]	WA
Commonwealth Land - [52099]	WA
Commonwealth Land - [51463]	WA
Commonwealth Land - [51702]	WA
Commonwealth Land - [51947]	WA
Commonwealth Land - [50325]	WA
Commonwealth Land - [51462]	WA
Commonwealth Land - [52109]	WA
Commonwealth Land - [51715]	WA
Commonwealth Land - [51720]	WA
Commonwealth Land - [51719]	WA
Commonwealth Land - [52198]	WA

Commonwealth Land Name	State
Commonwealth Land - [50975]	WA
Commonwealth Land - [51476]	WA
Commonwealth Land - [51474]	WA
Commonwealth Land - [50974]	WA
Commonwealth Land - [51473]	WA
Commonwealth Land - [51472]	WA
Commonwealth Land - [51471]	WA
Commonwealth Land - [51455]	WA
Commonwealth Land - [51457]	WA
Commonwealth Land - [51939]	WA
Commonwealth Land - [52108]	WA
Commonwealth Land - [51104]	WA
Commonwealth Land - [51696]	WA
Commonwealth Land - [52106]	WA
Commonwealth Land - [52104]	WA
Commonwealth Land - [52107]	WA
Commonwealth Land - [52105]	WA
Commonwealth Land - [52102]	WA
Commonwealth Land - [52103]	WA
Commonwealth Land - [52100]	WA
Commonwealth Land - [50326]	WA
Commonwealth Land - [51404]	WA
Commonwealth Land - [51887]	WA
Commonwealth Land - [51668]	WA
Commonwealth Land - [51713]	WA
Commonwealth Land - [51712]	WA
Commonwealth Land - [51711]	WA

Commonwealth Land Name	State
Commonwealth Land - [51710]	WA
Commonwealth Land - [51714]	WA
Commonwealth Land - [51717]	WA
Commonwealth Land - [51403]	WA
Commonwealth Land - [51666]	WA
Commonwealth Land - [51667]	WA
Commonwealth Land - [51718]	WA

Commonwealth Heritage Places

[Resource Information]

Name	State	Status
Historic		
HMAS Sydney II and HSK Kormoran Shipwreck Sites	EXT	Listed place
Natural		
Learmonth Air Weapons Range Facility	WA	Listed place
Mermaid Reef - Rowley Shoals	WA	Listed place
Ningaloo Marine Area - Commonwealth Waters	WA	Listed place

Listed Marine Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus		
Common Noddy [825]		Species or species habitat likely to occur within area
Anous tenuirostris melanops		
Australian Lesser Noddy [26000]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Roosting known to occur within area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Roosting known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Roosting known to occur within area overfly marine area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area overfly marine area
Calidris tenuirostris Great Knot [862]	Vulnerable	Roosting known to occur within area overfly marine area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Roosting known to occur within area overfly marine area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Breeding known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area
Glareola maldivarum Oriental Pratincole [840]		Roosting known to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area
Hirundo rustica Barn Swallow [662]		Species or species habitat known to occur within area overfly marine area
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Breeding known to occur within area
Larus pacificus Pacific Gull [811]		Breeding known to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Limnodromus semipalmatus Asian Dowitcher [843]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]	Endangered	Roosting known to occur within area overfly marine area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting known to occur within area overfly marine area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area

Scientific Name	Threatened Category	Presence Text
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Breeding known to occur within area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Papasula abbotti Abbott's Booby [59297]	Endangered	Species or species habitat may occur within area
Phaethon lepturus White-tailed Tropicbird [1014]		Breeding known to occur within area
Phaethon lepturus fulvus Christmas Island White-tailed Tropicbird, Golden Bosunbird [26021]	Endangered	Species or species habitat may occur within area
Phaethon rubricauda Red-tailed Tropicbird [994]		Breeding known to occur within area
Phalaropus lobatus Red-necked Phalarope [838]		Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]	Vulnerable	Roosting known to occur within area overfly marine area
Pterodroma macroptera Great-winged Petrel [1035]		Foraging, feeding or related behaviour known to occur within area

Scientific Name	Threatened Category	Presence Text
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Puffinus assimilis Little Shearwater [59363]		Foraging, feeding or related behaviour known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Roosting known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area
Sterna dougallii Roseate Tern [817]		Breeding known to occur within area
Sternula albifrons as Sterna albifrons Little Tern [82849]	Vulnerable	Breeding known to occur within area
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area
Stiltia isabella Australian Pratincole [818]		Roosting known to occur within area overfly marine area
Sula dactylatra Masked Booby [1021]		Breeding known to occur within area
Sula leucogaster Brown Booby [1022]		Breeding known to occur within area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area
Thalasseus bengalensis as Sterna bengalensis Lesser Crested Tern [66546]		Breeding known to occur within area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area
Tringa totanus Common Redshank, Redshank [835]		Roosting known to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Roosting known to occur within area overfly marine area
Fish		
[Acentronura australe](#) Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area
[Acentronura larsonae](#) Helen's Pygmy Pipehorse [66186]		Species or species habitat may occur within area
[Bhanotia fasciolata](#) Corrugated Pipefish, Barbed Pipefish [66188]		Species or species habitat may occur within area
[Bulbonaricus brauni](#) Braun's Pughead Pipefish, Pug-headed Pipefish [66189]		Species or species habitat may occur within area
[Campichthys galei](#) Gale's Pipefish [66191]		Species or species habitat may occur within area
[Campichthys tricarinatus](#) Three-keel Pipefish [66192]		Species or species habitat may occur within area
[Choeroichthys brachysoma](#) Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
[Choeroichthys latispinosus](#) Muiron Island Pipefish [66196]		Species or species habitat may occur within area
[Choeroichthys suillus](#) Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
[Corythoichthys amplexus](#) Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
Corythoichthys intestinalis Australian Messmate Pipefish, Banded Pipefish [66202]		Species or species habitat may occur within area
Corythoichthys schultzi Schultz's Pipefish [66205]		Species or species habitat may occur within area
Cosmocampus banneri Roughridge Pipefish [66206]		Species or species habitat may occur within area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus multiannulatus Many-banded Pipefish [66717]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex scalaris Ladder Pipefish [66216]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus dunckeri Red-hair Pipefish, Duncker's Pipefish [66220]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus spinosissimus Hedgehog Seahorse [66239]		Species or species habitat may occur within area
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Micrognathus micronotopterus Tidepool Pipefish [66255]		Species or species habitat may occur within area
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area
Phoxocampus belcheri Black Rock Pipefish [66719]		Species or species habitat may occur within area
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Vanacampus margaritifer		
Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammal		
Dugong dugon		
Dugong [28]		Breeding known to occur within area
Reptile		
Aipysurus apraefrontalis		
Short-nosed Sea Snake, Short-nosed Seasnake [1115]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus duboisii		
Dubois' Sea Snake, Dubois' Seasnake, Reef Shallows Sea Snake [1116]		Species or species habitat may occur within area
Aipysurus foliosquama		
Leaf-scaled Sea Snake, Leaf-scaled Seasnake [1118]	Critically Endangered	Species or species habitat known to occur within area
Aipysurus laevis		
Olive Sea Snake, Olive-brown Sea Snake [1120]		Species or species habitat may occur within area
Aipysurus mosaicus as Aipysurus eydouxii		
Mosaic Sea Snake [87261]		Species or species habitat may occur within area
Aipysurus pooleorum		
Shark Bay Sea Snake [66061]		Species or species habitat may occur within area
Aipysurus tenuis		
Brown-lined Sea Snake, Mjoberg's Sea Snake [1121]		Species or species habitat may occur within area
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas		
Green Turtle [1765]	Vulnerable	Breeding known to occur within area

Scientific Name	Threatened Category	Presence Text
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Emydocephalus annulatus Eastern Turtle-headed Sea Snake [1125]		Species or species habitat may occur within area
Ephalophis greyae as Ephalophis greyi Mangrove Sea Snake [93738]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Breeding known to occur within area
Hydrelaps darwiniensis Port Darwin Sea Snake, Black-ringed Mangrove Sea Snake [1100]		Species or species habitat may occur within area
Hydrophis czeblukovi Fine-spined Sea Snake [59233]		Species or species habitat may occur within area
Hydrophis elegans Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area
Hydrophis hardwickii as Lapemis hardwickii Spine-bellied Sea Snake [93516]		Species or species habitat may occur within area
Hydrophis kingii as Disteira kingii Spectacled Sea Snake [93511]		Species or species habitat may occur within area
Hydrophis macdowelli as Hydrophis mcdowelli MacDowell's Sea Snake, Small-headed Sea Snake, [75601]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Hydrophis major as Disteira major Olive-headed Sea Snake [93512]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Sea Snake, Ornate Reef Sea Snake [1111]		Species or species habitat may occur within area
Hydrophis peronii as Acalyptophis peronii Horned Sea Snake [93509]		Species or species habitat may occur within area
Hydrophis platura as Pelamis platurus Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area
Hydrophis stokesii as Astrotia stokesii Stokes' Sea Snake [93510]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area

Whales and Other Cetaceans		[Resource Information]
Current Scientific Name	Status	Type of Presence
Mammal		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area

Current Scientific Name	Status	Type of Presence
[Balaenoptera edeni](#) Bryde's Whale [35]		Species or species habitat likely to occur within area
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Migration route known to occur within area
[Balaenoptera physalus](#) Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
[Delphinus delphis](#) Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
[Feresa attenuata](#) Pygmy Killer Whale [61]		Species or species habitat may occur within area
[Globicephala macrorhynchus](#) Short-finned Pilot Whale [62]		Species or species habitat may occur within area
[Globicephala melas](#) Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
[Grampus griseus](#) Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
[Hyperoodon planifrons](#) Southern Bottlenose Whale [71]		Species or species habitat may occur within area
[Indopacetus pacificus](#) Longman's Beaked Whale [72]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
[Kogia breviceps](#) Pygmy Sperm Whale [57]		Species or species habitat may occur within area
[Kogia sima](#) Dwarf Sperm Whale [85043]		Species or species habitat may occur within area
[Lagenodelphis hosei](#) Fraser's Dolphin, Sarawak Dolphin [41]		Species or species habitat may occur within area
[Lissodelphis peronii](#) Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
[Megaptera novaeangliae](#) Humpback Whale [38]		Breeding known to occur within area
[Mesoplodon bowdoini](#) Andrew's Beaked Whale [73]		Species or species habitat may occur within area
[Mesoplodon densirostris](#) Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
[Mesoplodon ginkgodens](#) Gingko-toothed Beaked Whale, Gingko-toothed Whale, Gingko Beaked Whale [59564]		Species or species habitat may occur within area
[Mesoplodon grayi](#) Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
[Mesoplodon layardii](#) Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
[Mesoplodon mirus](#) True's Beaked Whale [54]		Species or species habitat may occur within area

Current Scientific Name	Status	Type of Presence
[Orcaella heinsohni](#) Australian Snubfin Dolphin [81322]	Vulnerable	Species or species habitat known to occur within area
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area
[Peponocephala electra](#) Melon-headed Whale [47]		Species or species habitat may occur within area
[Physeter macrocephalus](#) Sperm Whale [59]		Species or species habitat may occur within area
[Pseudorca crassidens](#) False Killer Whale [48]		Species or species habitat likely to occur within area
[Sousa sahulensis](#) Australian Humpback Dolphin [87942]	Vulnerable	Species or species habitat known to occur within area
[Stenella attenuata](#) Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
[Stenella coeruleoalba](#) Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area
[Stenella longirostris](#) Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area
[Steno bredanensis](#) Rough-toothed Dolphin [30]		Species or species habitat may occur within area
[Tursiops aduncus](#) Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area

Current Scientific Name	Status	Type of Presence
Tursiops aduncus (Arafura/Timor Sea populations)		
Spotted Bottlenose Dolphin (Arafura/Timor Sea populations) [78900]		Species or species habitat known to occur within area
Tursiops truncatus s. str.		
Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris		
Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Australian Marine Parks

[Resource Information]

Park Name	Zone & IUCN Categories
Abrolhos	Habitat Protection Zone (IUCN IV)
Carnarvon Canyon	Habitat Protection Zone (IUCN IV)
Dampier	Habitat Protection Zone (IUCN IV)
Gascoyne	Habitat Protection Zone (IUCN IV)
Gascoyne	Habitat Protection Zone (IUCN IV)
Abrolhos	Multiple Use Zone (IUCN VI)
Abrolhos	Multiple Use Zone (IUCN VI)
Abrolhos	Multiple Use Zone (IUCN VI)
Argo-Rowley Terrace	Multiple Use Zone (IUCN VI)
Argo-Rowley Terrace	Multiple Use Zone (IUCN VI)
Dampier	Multiple Use Zone (IUCN VI)
Eighty Mile Beach	Multiple Use Zone (IUCN VI)
Gascoyne	Multiple Use Zone (IUCN VI)
Kimberley	Multiple Use Zone (IUCN VI)
Montebello	Multiple Use Zone (IUCN VI)

Park Name	Zone & IUCN Categories
Shark Bay	Multiple Use Zone (IUCN VI)
Abrolhos	National Park Zone (IUCN II)
Abrolhos	National Park Zone (IUCN II)
Abrolhos	National Park Zone (IUCN II)
Argo-Rowley Terrace	National Park Zone (IUCN II)
Dampier	National Park Zone (IUCN II)
Gascoyne	National Park Zone (IUCN II)
Mermaid Reef	National Park Zone (IUCN II)
Ningaloo	National Park Zone (IUCN II)
Ningaloo	Recreational Use Zone (IUCN IV)
Ningaloo	Recreational Use Zone (IUCN IV)
Abrolhos	Special Purpose Zone (IUCN VI)
Abrolhos	Special Purpose Zone (IUCN VI)
Argo-Rowley Terrace	Special Purpose Zone (Trawl) (IUCN VI)

Habitat Critical to the Survival of Marine Turtles		[Resource Information]
Scientific Name	Behaviour	Presence
All year (Jun - Aug)		
Natator depressus		
Flatback Turtle [59257]	Nesting	Known to occur
Nov-Feb		
Caretta caretta		
Loggerhead Turtle [1763]	Nesting	Known to occur
Oct - Feb		
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Nesting	Known to occur
Oct - Mar		
Chelonia mydas		
Green Turtle [1765]	Nesting	Known to occur

Extra Information

State and Territory Reserves		[Resource Information]
Protected Area Name	Reserve Type	State
Airlie Island	Nature Reserve	WA
Barrow Island	Nature Reserve	WA
Barrow Island	Marine Park	WA
Barrow Island	Marine Management Area	WA
Bedout Island	Nature Reserve	WA
Bessieres Island	Nature Reserve	WA
Boodie, Double Middle Islands	Nature Reserve	WA
Bundegi Coastal Park	5(1)(h) Reserve	WA
Burnside And Simpson Island	Nature Reserve	WA
Cape Range	National Park	WA
Cape Range (South)	National Park	WA
Dirk Hartog Island	National Park	WA
Eighty Mile Beach	Marine Park	WA
Gnandaroo Island	Nature Reserve	WA
Great Sandy Island	Nature Reserve	WA
Great Sandy Island	Nature Reserve	WA
Jarrkunpungu	Nature Reserve	WA
Jurabi Coastal Park	5(1)(h) Reserve	WA
Kujungurru Warrarn	Nature Reserve	WA
Kujungurru Warrarn	Conservation Park	WA
Little Rocky Island	Nature Reserve	WA
Locker Island	Nature Reserve	WA
Lowendal Islands	Nature Reserve	WA
Montebello Islands	Conservation Park	WA

Protected Area Name	Reserve Type	State
Montebello Islands	Marine Park	WA
Montebello Islands	Conservation Park	WA
Muiron Islands	Nature Reserve	WA
Muiron Islands	Marine Management Area	WA
Murujuga	National Park	WA
Ningaloo	Marine Park	WA
North Sandy Island	Nature Reserve	WA
North Turtle Island	Nature Reserve	WA
Nyingguulu (Ningaloo) Coastal Reserve	5(1)(h) Reserve	WA
Rocky Island	Nature Reserve	WA
Round Island	Nature Reserve	WA
Rowley Shoals	Marine Park	WA
Serrurier Island	Nature Reserve	WA
Tent Island	Nature Reserve	WA
Thevenard Island	Nature Reserve	WA
Thevenard Island	Nature Reserve	WA
Unnamed WA36907	5(1)(h) Reserve	WA
Unnamed WA36909	5(1)(h) Reserve	WA
Unnamed WA36910	5(1)(h) Reserve	WA
Unnamed WA36913	Nature Reserve	WA
Unnamed WA36915	Nature Reserve	WA
Unnamed WA37500	5(1)(g) Reserve	WA
Unnamed WA40322	5(1)(h) Reserve	WA
Unnamed WA40877	5(1)(h) Reserve	WA
Unnamed WA44665	5(1)(h) Reserve	WA
Unnamed WA44667	5(1)(h) Reserve	WA

Protected Area Name	Reserve Type	State
Unnamed WA44672	5(1)(h) Reserve	WA
Unnamed WA52366	Nature Reserve	WA
Unnamed WA53015	Nature Reserve	WA
Victor Island	Nature Reserve	WA
Weld Island	Nature Reserve	WA
Y Island	Nature Reserve	WA

Nationally Important Wetlands

[Resource Information]

Wetland Name	State
Cape Range Subterranean Waterways	WA
Eighty Mile Beach System	WA
Exmouth Gulf East	WA
Leslie (Port Hedland) Saltfields System	WA
Mermaid Reef	EXT

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status
3D Seismic Survey in the Carnarvon Bsin on the North West Shelf	2002/778		Completed
Babylon 3D Marine Seismic Survey, Commonwealth Waters, nr Exmouth WA	2013/7081		Completed
Balla Balla Export Facilities ? Design Variation	2022/09254		Assessment
Browse Carbon Capture and Storage Project	2024/10028		Referral Decision
Browse to North West Shelf Development, Indian Ocean, WA	2018/8319		Approval
Dampier Seawater Desalination Plant	2022/09395		Completed
DAVROS MC 3D marine seismic survey northwaet of Dampier, WA	2013/7092		Completed
Deep Water Northwest Shelf 2D Seismic Survey	2007/3260		Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Development of Mutineer and Exeter petroleum fields for oil production, Permit	2003/1033		Completed
Gorgon Gas Development	2003/1294		Post-Approval
Marine Route Survey for Subsea Fibre Optic Data Cable System - Australia West	2024/09826		Completed
Ningaloo Lighthouse Development, 17km north west Exmouth, Western Australia	2020/8693		Post-Approval
North West Shelf Project Extension, Carnarvon Basin, WA	2018/8335		Approval
Offshore Dredge Spoil Disposal - Mardie Project	2024/10054		Referral Decision
Optimised Mardie Project ? Additional Triodia Grassland Habitat Clearing	2024/10094		Referral Decision
Optimised Mardie Solar Salt Project	2022/9169		Post-Approval
Port Hedland Green Steel Project - Stage 1	2023/09764		Assessment
Project Highclere Cable Lay and Operation	2022/09203		Completed
Ridley Magnetite Project	2023/09477		Referral Decision
Single Jetty Deep Water Port Renewable Hub, WA	2021/8942		Assessment
Winu Copper and Gold Mine (Winu Project)	2024/09804		Completed
Action clearly unacceptable			
Asian Renewable Energy Hub Revised Proposal, WA	2021/8891	Action Clearly Unacceptable	Completed
Highlands 3D Marine Seismic Survey	2012/6680	Action Clearly Unacceptable	Completed
Controlled action			
'Van Gogh' Petroleum Field Development	2007/3213	Controlled Action	Post-Approval
2-D seismic survey Scott Reef	2000/125	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Additional Rail Infrastructure between Herb Elliott Port Facility and Cloudbreak Mine Site	2010/5513	Controlled Action	Post-Approval
Anketell Point Iron Ore Processing & Export Port	2009/5120	Controlled Action	Post-Approval
Asian Renewable Energy Hub, 220 km east of Port Hedland, Western Australia	2017/8112	Controlled Action	Post-Approval
Balmoral South Iron Ore Mine	2008/4236	Controlled Action	Post-Approval
Binowee Iron Ore Project	2001/366	Controlled Action	Proposed Decision
Boating Facility	2002/830	Controlled Action	Completed
Browse FLNG Development, Commonwealth Waters	2013/7079	Controlled Action	Post-Approval
Cape Lambert Port B Development	2008/4032	Controlled Action	Post-Approval
Construct and operate LNG & domestic gas plant including onshore and offshore facilities - Wheatston	2008/4469	Controlled Action	Post-Approval
Construction and operation of a Solar Salt Project, SW Onslow, WA	2016/7793	Controlled Action	Assessment Approach
Develop Jansz-Io deepwater gas field in Permit Areas WA-18-R, WA-25-R and WA-26-	2005/2184	Controlled Action	Post-Approval
Development of Angel gas and condensate field, North West Shelf	2004/1805	Controlled Action	Post-Approval
Development of an iron ore mine and associated infrastructure	2010/5630	Controlled Action	Assessment Approach
Development of Browse Basin Gas Fields (Upstream)	2008/4111	Controlled Action	Completed
Development of Coniston/Novara fields within the Exmouth Sub-basin	2011/5995	Controlled Action	Post-Approval
Development of Stybarrow petroleum field incl drilling and facility installation	2004/1469	Controlled Action	Post-Approval
Echo-Yodel Production Wells	2000/11	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Enfield full field development	2001/257	Controlled Action	Post-Approval
Equus Gas Fields Development Project, Carnarvon Basin	2012/6301	Controlled Action	Completed
Eramurra Industrial Salt Project	2021/9027	Controlled Action	Assessment Approach
Eramurra Industrial Salt Project, near Karratha, WA	2019/8448	Controlled Action	Completed
Gorgon Gas Development 4th Train Proposal	2011/5942	Controlled Action	Post-Approval
Gorgon Gas Revised Development	2008/4178	Controlled Action	Post-Approval
Greater Enfield (Vincent) Development	2005/2110	Controlled Action	Post-Approval
Greater Gorgon Development - Optical Fibre Cable, Mainland to Barrow Island	2005/2141	Controlled Action	Completed
Great Northern Pipeline - 630 km buried gas pipeline	2009/5257	Controlled Action	Completed
Light Crude Oil Production	2001/365	Controlled Action	Post-Approval
Mardie Project, 80 km south west of Karratha, WA	2018/8236	Controlled Action	Post-Approval
Mauds Landing Marina	2000/98	Controlled Action	Completed
Nava-1 Cable System	2001/510	Controlled Action	Completed
Perdaman Urea Project, near Karratha, WA	2018/8383	Controlled Action	Post-Approval
Pluto Gas Project	2005/2258	Controlled Action	Completed
Pluto Gas Project Including Site B	2006/2968	Controlled Action	Post-Approval
Port Hedland Outer Harbour Development and associated marine and terrestrial in	2008/4159	Controlled Action	Post-Approval
Port Hedland Spoilbank Marina, WA	2019/8520	Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Proposed West Pilbara Iron Ore Project	2009/4706	Controlled Action	Post-Approval
Pyrenees Oil Fields Development	2005/2034	Controlled Action	Post-Approval
Simpson Development	2000/59	Controlled Action	Completed
Simpson Oil Field Development	2001/227	Controlled Action	Post-Approval
The Scarborough Project - FLNG & assoc subsea infrastructure, Carnarvon Basin	2013/6811	Controlled Action	Post-Approval
Vincent Appraisal Well	2000/22	Controlled Action	Post-Approval
Yardie Creek Road Realignment Project	2021/8967	Controlled Action	Assessment Approach
Not controlled action			
'Goodwyn A' Low Pressure Train Project	2003/914	Not Controlled Action	Completed
'Van Gogh' Oil Appraisal Drilling Program, Exploration Permit Area WA-155-P(1)	2006/3148	Not Controlled Action	Completed
Airlie Island soil and groundwater investigations, Exmouth Gulf, offshore Pilbara coast	2014/7250	Not Controlled Action	Completed
APX-West Fibre-optic telecommunications cable system, WA to Singapore	2013/7102	Not Controlled Action	Completed
archaeological surveys & excavation at historic sites, Cape Inscription	2006/3027	Not Controlled Action	Completed
Baniyas-1 Exploration Well, EP-424, near Onslow	2007/3282	Not Controlled Action	Completed
Barrow Island 2D Seismic survey	2006/2667	Not Controlled Action	Completed
Boating Facility	2002/832	Not Controlled Action	Completed
Bollinger 2D Seismic Survey 200km North of North West Cape WA	2004/1868	Not Controlled Action	Completed
Bultaco-2, Laverda-2, Laverda-3 and Montesa-2 Appraisal Wells	2000/103	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Cape Lambert Port A Marine Structures Refurbishment Project	2018/8370	Not Controlled Action	Completed
Carnarvon 3D Marine Seismic Survey	2004/1890	Not Controlled Action	Completed
Cazadores 2D seismic survey	2004/1720	Not Controlled Action	Completed
Construct 110km buried natural gas pipeline from Onslow, connecting to Dampier/Bunbury natural gas p	2013/7039	Not Controlled Action	Completed
Construction and operation of an unmanned sea platform and connecting pipeline to Varanus Island for	2004/1703	Not Controlled Action	Completed
Construction of a Commodities Berth, Wharf and Associated Infrastructure	2008/4129	Not Controlled Action	Completed
Controlled Source Electromagnetic Survey	2007/3262	Not Controlled Action	Completed
Development of Halyard Field off the west coast of WA	2010/5611	Not Controlled Action	Completed
Development of iron ore facilities	2013/7013	Not Controlled Action	Completed
Development of iron ore resources in eastern Pilbara region, including port at P	2004/1562	Not Controlled Action	Completed
Differential Global Positioning System (DGPS)	2001/445	Not Controlled Action	Completed
Drilling between Kalbarri and Cliff Head	2005/2185	Not Controlled Action	Completed
Drilling of an exploration well Gats-1 in Permit Area WA-261-P	2004/1701	Not Controlled Action	Completed
Drilling of exploration wells, Permit areas WA-301-P to WA-305-P	2002/769	Not Controlled Action	Completed
Eagle-1 Exploration Drilling, North West Shelf, WA	2019/8578	Not Controlled Action	Completed
Echo A Development WA-23-L, WA-24-L	2005/2042	Not Controlled Action	Completed
Expansion of the Sino Iron Ore Mine and export facilities, Cape Preston, WA	2017/7862	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Expansion Proposal, Mineralogy Cape Preston Iron Ore Project, Cape Preston, WA	2009/5010	Not Controlled Action	Completed
Exploration drilling well WA-155-P(1)	2003/971	Not Controlled Action	Completed
Exploration of appraisal wells	2006/3065	Not Controlled Action	Completed
Exploration Well (Taunton-2)	2002/731	Not Controlled Action	Completed
Exploration Well in Permit Area WA-155-P(1)	2002/759	Not Controlled Action	Completed
Exploratory drilling in permit area WA-225-P	2001/490	Not Controlled Action	Completed
Extension of Simpson Oil Platforms & Wells	2002/685	Not Controlled Action	Completed
Hadda 1,Flying Foam 1,Magnat 1 exploration drill	2004/1697	Not Controlled Action	Completed
HCA05X Macedon Experimental Survey	2004/1926	Not Controlled Action	Completed
Hess Exploration Drilling Programme	2007/3566	Not Controlled Action	Completed
Huascaran-1 exploration well (WA-292-P)	2001/539	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO West Submarine Telecommunications Cable, WA	2017/8126	Not Controlled Action	Completed
Infill Production Well (Griffin-9)	2001/417	Not Controlled Action	Completed
Jansz-2 and 3 Appraisal Wells	2002/754	Not Controlled Action	Completed
Klammer 2D Seismic Survey	2002/868	Not Controlled Action	Completed
Mahimahi Aquaculture Facility	2002/891	Not Controlled Action	Completed
Maia-Gaea Exploration wells	2000/17	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Manaslu - 1 and Huascaran - 1 Offshore Exploration Wells	2001/235	Not Controlled Action	Completed
Mermaid Marine Australia Desalination Project	2011/5916	Not Controlled Action	Completed
Montesa-1 and Bultaco-1 Exploration Wells	2000/102	Not Controlled Action	Completed
Murujuga archaeological excavation, collection and sampling, Dampier Archipelago, WA	2014/7160	Not Controlled Action	Completed
North Rankin B gas compression facility	2005/2500	Not Controlled Action	Completed
Onslow Power Infrastructure Upgrade Project, Onslow, WA	2014/7314	Not Controlled Action	Completed
Onslow Water Supply Infrastructure Upgrade Project, Onslow, WA	2014/7329	Not Controlled Action	Completed
Pilbara Bulk Ore Transport System Project, WA	2016/7637	Not Controlled Action	Completed
Pipeline System Modifications Project	2000/3	Not Controlled Action	Completed
Port Expansion and Dredging	2003/1265	Not Controlled Action	Completed
Port Hedland Channel Risk and Optimisation Project, WA	2017/7915	Not Controlled Action	Completed
Project Highclere Geophysical Survey	2021/9023	Not Controlled Action	Completed
Rail and Port Facilities	2001/474	Not Controlled Action	Completed
Searipple gas and condensate field development	2000/89	Not Controlled Action	Completed
Seismic Survey, Bremer Basin, Mentelle Basin and Zeewyck Sub-basin	2004/1700	Not Controlled Action	Completed
Spool Base Facility	2001/263	Not Controlled Action	Completed
Subsea Gas Pipeline From Stybarrow Field to Griffin Venture Gas Export Pipeline	2005/2033	Not Controlled Action	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
sub-sea tieback of Perseus field wells	2004/1326	Not Controlled Action	Completed
Telfer Gold Mine Project - Mine and Borefield Extensions and Upgrade of Storage	2002/787	Not Controlled Action	Completed
Telstra North Rankin Spur Fibre Optic Cable	2016/7836	Not Controlled Action	Completed
Thevenard Island Retirement Project	2015/7423	Not Controlled Action	Completed
To construct and operate an offshore submarine fibre optic cable, WA	2014/7373	Not Controlled Action	Completed
WA-295-P Kerr-McGee Exploration Wells	2001/152	Not Controlled Action	Completed
Walkway Lighting Upgrade	2009/4965	Not Controlled Action	Completed
Wanda Offshore Research Project, 80 km north-east of Exmouth, WA	2018/8293	Not Controlled Action	Completed
Western Flank Gas Development	2005/2464	Not Controlled Action	Completed
Wheatstone 3D seismic survey, 70km north of Barrow Island	2004/1761	Not Controlled Action	Completed
Not controlled action (particular manner)			
'Kate' 3D marine seismic survey, exploration permits WA-320-P and WA-345-P, 60km	2005/2037	Not Controlled Action (Particular Manner)	Post-Approval
'Tourmaline' 2D marine seismic survey, permit areas WA-323-P, WA-330-P and WA-32	2005/2282	Not Controlled Action (Particular Manner)	Post-Approval
"Leanne" offshore 3D seismic exploration, WA-356-P	2005/1938	Not Controlled Action (Particular Manner)	Post-Approval
2D and 3D seismic surveys	2005/2151	Not Controlled Action (Particular Manner)	Post-Approval
2D marine seismic survey	2012/6296	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
2D Marine Seismic Survey in Permit Area WA-337-P	2003/1158	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey	2008/4493	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey	2005/2146	Not Controlled Action (Particular Manner)	Post-Approval
2D Seismic Survey Permit Area WA-352-P	2008/4628	Not Controlled Action (Particular Manner)	Post-Approval
2D seismic survey within permit WA-291	2007/3265	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey	2008/4281	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey (WA-482-P, WA-363-P), WA	2013/6761	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey in Permit Areas WA-15-R, WA-18-R, WA-205-P, WA-253-P, WA-267-P and WA-268-P	2003/1271	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Survey in WA 457-P & WA 458-P, North West Shelf, offshore WA	2013/6862	Not Controlled Action (Particular Manner)	Post-Approval
3D marine seismic survey over petroleum title WA-268-P	2007/3458	Not Controlled Action (Particular Manner)	Post-Approval
3D Marine Seismic Surveys - Contos CT-13 & Supertubes CT-13, offshore WA	2013/6901	Not Controlled Action (Particular Manner)	Post-Approval
3D seismic survey	2006/2715	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
3D Seismic Survey, near Scott Reef, Browse Basin	2005/2126	Not Controlled Action (Particular Manner)	Post-Approval
3D Seismic Survey, WA	2008/4428	Not Controlled Action (Particular Manner)	Post-Approval
3D sesmic survey	2006/2781	Not Controlled Action (Particular Manner)	Post-Approval
Acheron Non-Exclusive 2D Seismic Survey	2009/4968	Not Controlled Action (Particular Manner)	Post-Approval
Acheron Non-Exclusive 2D Seismic Survey	2008/4565	Not Controlled Action (Particular Manner)	Post-Approval
Additional Rail Infrastructure	2012/6314	Not Controlled Action (Particular Manner)	Post-Approval
Agrippina 3D Seismic Marine Survey	2009/5212	Not Controlled Action (Particular Manner)	Post-Approval
Algae Farm and Processing Facilities	2012/6596	Not Controlled Action (Particular Manner)	Post-Approval
Apache Northwest Shelf Van Gogh Field Appraisal Drilling Program	2007/3495	Not Controlled Action (Particular Manner)	Post-Approval
Aperio 3D Marine Seismic Survey, WA	2012/6648	Not Controlled Action (Particular Manner)	Post-Approval
Artemis-1 Drilling Program (WA-360-P)	2010/5432	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Australia to Singapore Fibre Optic Submarine Cable System	2011/6127	Not Controlled Action (Particular Manner)	Post-Approval
Balnaves Condensate Field Development	2011/6188	Not Controlled Action (Particular Manner)	Post-Approval
Bonaventure 3D seismic survey	2006/2514	Not Controlled Action (Particular Manner)	Post-Approval
Cable Seismic Exploration Permit areas WA-323-P and WA-330-P	2008/4227	Not Controlled Action (Particular Manner)	Post-Approval
Cape Preston East - Iron Ore Export Facilities, Pilbara, WA	2013/6844	Not Controlled Action (Particular Manner)	Post-Approval
Cerberus exploration drilling campaign, Carnarvon Basin, WA	2016/7645	Not Controlled Action (Particular Manner)	Post-Approval
CGGVERITAS 2010 2D Seismic Survey	2010/5714	Not Controlled Action (Particular Manner)	Post-Approval
Charon 3D Marine Seismic Survey	2007/3477	Not Controlled Action (Particular Manner)	Post-Approval
Consturction & operation of the Varanus Island kitchen & mess cyclone refuge building, compression p	2013/6952	Not Controlled Action (Particular Manner)	Post-Approval
Coverack Marine Seismic Survey	2001/399	Not Controlled Action (Particular Manner)	Post-Approval
Cue Seismic Survey within WA-359-P, WA-361-P and WA-360-P	2007/3647	Not Controlled Action (Particular Manner)	Post-Approval
CVG 3D Marine Seismic Survey	2012/6654	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Decommissioning of the Legendre facilities	2010/5681	Not Controlled Action (Particular Manner)	Post-Approval
Deep Water Drilling Program	2010/5532	Not Controlled Action (Particular Manner)	Post-Approval
Demeter 3D Seismic Survey, off Dampier, WA	2002/900	Not Controlled Action (Particular Manner)	Post-Approval
Diesel Fuel Bunker Operation	2012/6289	Not Controlled Action (Particular Manner)	Post-Approval
Draeck 3D Marine Seismic Survey, WA-205-P	2006/3067	Not Controlled Action (Particular Manner)	Post-Approval
Dredging of marine sediment to enable construction of eight berths and a turnin	2010/5678	Not Controlled Action (Particular Manner)	Post-Approval
Drilling 35-40 offshore exploration wells in deep water	2008/4461	Not Controlled Action (Particular Manner)	Post-Approval
Earthworks for kitchen/mess, cyclone refuge building & Compression Plant, Varanus Island	2013/6900	Not Controlled Action (Particular Manner)	Post-Approval
Eendracht Multi-Client 3D Marine Seismic Survey	2009/4749	Not Controlled Action (Particular Manner)	Post-Approval
Effect of marine seismic sounds to demersal fish and pearl oysters, north-west WA	2018/8169	Not Controlled Action (Particular Manner)	Post-Approval
Enfield M3 & Vincent 4D Marine Seismic Surveys	2008/3981	Not Controlled Action (Particular Manner)	Completed

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Enfield M3 4D, Vincent 4D & 4D Line Test Marine Seismic Surveys	2008/4122	Not Controlled Action (Particular Manner)	Post-Approval
Enfield M4 4D Marine Seismic Survey	2008/4558	Not Controlled Action (Particular Manner)	Post-Approval
Enfield oilfield 3D Seismic Survey	2006/3132	Not Controlled Action (Particular Manner)	Post-Approval
Exmouth West 2D Marine Seismic Survey	2008/4132	Not Controlled Action (Particular Manner)	Post-Approval
Exploration drilling of Zeus-1 well	2008/4351	Not Controlled Action (Particular Manner)	Post-Approval
Fletcher-Finucane Development, WA26-L and WA191-P	2011/6123	Not Controlled Action (Particular Manner)	Post-Approval
Foxhound 3D Non-Exclusive Marine Seismic Survey	2009/4703	Not Controlled Action (Particular Manner)	Post-Approval
Gazelle 3D Marine Seismic Survey in WA-399-P and WA-42-L	2010/5570	Not Controlled Action (Particular Manner)	Post-Approval
Geco Eagle 3D Marine Seismic Survey	2008/3958	Not Controlled Action (Particular Manner)	Post-Approval
Geoscience Australia - Marine survey in Browse Basin to acquire data to assist assessment of CO2 sto	2013/6747	Not Controlled Action (Particular Manner)	Post-Approval
Glencoe 3D Marine Seismic Survey WA-390-P	2007/3684	Not Controlled Action (Particular Manner)	Post-Approval
Greater Western Flank Phase 1 gas Development	2011/5980	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Grimalkin 3D Seismic Survey	2008/4523	Not Controlled Action (Particular Manner)	Post-Approval
Guacamole 2D Marine Seismic Survey	2008/4381	Not Controlled Action (Particular Manner)	Post-Approval
Harmony 3D Marine Seismic Survey	2012/6699	Not Controlled Action (Particular Manner)	Post-Approval
Harpy 1 exploration well	2001/183	Not Controlled Action (Particular Manner)	Post-Approval
Honeycombs MC3D Marine Seismic Survey	2012/6368	Not Controlled Action (Particular Manner)	Post-Approval
Huzzas MC3D Marine Seismic Survey (HZ-13) Carnarvon Basin, offshore WA	2013/7003	Not Controlled Action (Particular Manner)	Post-Approval
Huzzas phase 2 marine seismic survey, Exmouth Plateau, Northern Carnarvon Basin, WA	2013/7093	Not Controlled Action (Particular Manner)	Post-Approval
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval
John Ross & Rosella Off Bottom Cable Seismic Exploration Program	2008/3966	Not Controlled Action (Particular Manner)	Post-Approval
Judo Marine 3D Seismic Survey within and adjacent to WA-412-P	2009/4801	Not Controlled Action (Particular Manner)	Post-Approval
Judo Marine 3D Seismic Survey within and adjacent to WA-412-P	2008/4630	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Julimar Brunello Gas Development Project	2011/5936	Not Controlled Action (Particular Manner)	Post-Approval
Kingtree & Ironstone-1 Exploration Wells	2011/5935	Not Controlled Action (Particular Manner)	Post-Approval
Klimt 2D Marine Seismic Survey	2007/3856	Not Controlled Action (Particular Manner)	Post-Approval
Koolama 2D Seismic Survey Dampier Basin	2010/5420	Not Controlled Action (Particular Manner)	Post-Approval
Laverda 3D Marine Seismic Survey and Vincent M1 4D Marine Seismic Survey	2010/5415	Not Controlled Action (Particular Manner)	Post-Approval
Laying a submarine optical fibre telecommunications cable, Perth to Singapore and Jakarta	2014/7332	Not Controlled Action (Particular Manner)	Post-Approval
Leopard 2D marine seismic survey	2005/2290	Not Controlled Action (Particular Manner)	Post-Approval
Lion 2D Marine Seismic Survey	2007/3777	Not Controlled Action (Particular Manner)	Post-Approval
Macedon Gas Field Development	2008/4605	Not Controlled Action (Particular Manner)	Post-Approval
Marine Geotechnical Drilling Program	2008/4012	Not Controlled Action (Particular Manner)	Post-Approval
Marine reconnaissance survey	2008/4466	Not Controlled Action (Particular Manner)	Post-Approval
Mariner Non-Exclusive 2D Seismic Survey	2011/6172	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Millstream 20GL Pipeline, Bungaroo, Borefield Integration	2012/6379	Not Controlled Action (Particular Manner)	Post-Approval
Moosehead 2D seismic survey within permit WA-192-P	2005/2167	Not Controlled Action (Particular Manner)	Post-Approval
Munmorah 2D seismic survey within permits WA-308/9-P	2003/970	Not Controlled Action (Particular Manner)	Post-Approval
Nelson Point Dredging	2009/4920	Not Controlled Action (Particular Manner)	Post-Approval
Ocean Bottom Cable Seismic Program, WA-264-P	2007/3844	Not Controlled Action (Particular Manner)	Post-Approval
Ocean Bottom Cable Seismic Survey	2005/2017	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Canning Multi Client 2D Marine Seismic Survey	2010/5393	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Drilling Campaign	2011/5830	Not Controlled Action (Particular Manner)	Post-Approval
Offshore Fibre Optic Cable Network Construction & Operation, Port Hedland WA to Darwin NT	2014/7223	Not Controlled Action (Particular Manner)	Post-Approval
Onslow Seawater Desalination Plant Marine Geophysical Investigation	2020/8794	Not Controlled Action (Particular Manner)	Post-Approval
Orcus 3D Marine Seismic Survey in WA-450-P	2010/5723	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Osprey and Dionysus Marine Seismic Survey	2011/6215	Not Controlled Action (Particular Manner)	Post-Approval
Outer Canning exploration drilling program off NW coast of WA	2012/6618	Not Controlled Action (Particular Manner)	Post-Approval
Palta-1 exploration well in Petroleum Permit Area WA-384-P	2011/5871	Not Controlled Action (Particular Manner)	Post-Approval
Phoenix 3D Seismic Survey, Bedout Sub-Basin	2010/5360	Not Controlled Action (Particular Manner)	Post-Approval
Pomodoro 3D Marine Seismic Survey in WA-426-P and WA-427-P	2010/5472	Not Controlled Action (Particular Manner)	Post-Approval
Port Headland Outer Harbour Pre-construction Pilling program	2012/6341	Not Controlled Action (Particular Manner)	Post-Approval
Port of Port Hedland channel marker replacement project, WA	2017/8010	Not Controlled Action (Particular Manner)	Post-Approval
Port Walcott upgrade, dredging & spoil disposal, & channel realignment	2006/2806	Not Controlled Action (Particular Manner)	Post-Approval
Pyrenees 4D Marine Seismic Monitor Survey, HCA12A	2012/6579	Not Controlled Action (Particular Manner)	Post-Approval
Pyrenees-Macedon 3D marine seismic survey	2005/2325	Not Controlled Action (Particular Manner)	Post-Approval
Quiberon 2D Seismic Survey, permit area WA-385P, offshore of Carnarvon	2009/5077	Not Controlled Action (Particular Manner)	Post-Approval
Reindeer gas reservior development, Devil Creek, Carnarvon Basin - WA	2007/3917	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Repsol 3d & 2D Marine Seismic Survey	2012/6658	Not Controlled Action (Particular Manner)	Post-Approval
Rose 3D Seismic Program	2008/4239	Not Controlled Action (Particular Manner)	Post-Approval
Rydal-1 Petroleum Exploration Well, WA	2012/6522	Not Controlled Action (Particular Manner)	Post-Approval
Salsa 3D Marine Seismic Survey	2010/5629	Not Controlled Action (Particular Manner)	Post-Approval
Santos Winchester three dimensional seismic survey - WA-323-P & WA-330-P	2011/6107	Not Controlled Action (Particular Manner)	Post-Approval
Scarborough Development nearshore component, NWS, WA	2018/8362	Not Controlled Action (Particular Manner)	Post-Approval
search for HMAS Sydney	2006/3071	Not Controlled Action (Particular Manner)	Post-Approval
Skorpion Marine Seismic Survey WA	2001/416	Not Controlled Action (Particular Manner)	Post-Approval
Sovereign 3D Marine Seismic Survey	2011/5861	Not Controlled Action (Particular Manner)	Post-Approval
Stag 4D & Reindeer MAZ Marine Seismic Surveys, WA	2013/7080	Not Controlled Action (Particular Manner)	Post-Approval
Stag Off-bottom Cable Seismic Survey	2007/3696	Not Controlled Action (Particular Manner)	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
Stybarrow 4D Marine Seismic Survey	2011/5810	Not Controlled Action (Particular Manner)	Post-Approval
Stybarrow Baseline 4D marine seismic survey	2008/4530	Not Controlled Action (Particular Manner)	Post-Approval
Tantabiddi Boat Ramp Sand Bypassing	2015/7411	Not Controlled Action (Particular Manner)	Post-Approval
The Dampier Heavy Load Out Facility Berth and Swing Basin Expansion	2012/6271	Not Controlled Action (Particular Manner)	Post-Approval
Tidepole Maz 3D Seismic Survey Campaign	2007/3706	Not Controlled Action (Particular Manner)	Post-Approval
Tortilla 2D Seismic Survey, WA	2011/6110	Not Controlled Action (Particular Manner)	Post-Approval
Triton 3D Marine Seismic Survey, WA-2-R and WA-3-R	2006/2609	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a 3D marine seismic survey	2010/5695	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5715	Not Controlled Action (Particular Manner)	Post-Approval
Undertake a three dimensional marine seismic survey	2010/5679	Not Controlled Action (Particular Manner)	Post-Approval
upgrade of 3 community recreation sites	2005/2349	Not Controlled Action (Particular Manner)	Post-Approval
Vampire 2D Non Exclusive Seismic Survey, WA	2010/5543	Not Controlled Action (Particular	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		Manner)	
Veritas Voyager 2D Marine Seismic Survey	2009/5151	Not Controlled Action (Particular Manner)	Post-Approval
Vincent M1 and Enfield M5 4D Marine Seismic Survey	2010/5720	Not Controlled Action (Particular Manner)	Post-Approval
Warramunga Non-Inclusive 3D Seismic Survey	2008/4553	Not Controlled Action (Particular Manner)	Post-Approval
West Anchor 3D Marine Seismic Survey	2008/4507	Not Controlled Action (Particular Manner)	Post-Approval
West Panaeus 3D seismic survey	2006/3141	Not Controlled Action (Particular Manner)	Post-Approval
Westralia SPAN Marine Seismic Survey, WA & NT	2012/6463	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone 3D MAZ Marine Seismic Survey	2011/6058	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone Iago Appraisal Well Drilling	2008/4134	Not Controlled Action (Particular Manner)	Post-Approval
Wheatstone Iago Appraisal Well Drilling	2007/3941	Not Controlled Action (Particular Manner)	Post-Approval
Woodside Southern Browse 3D Seismic Survey, WA	2007/3534	Not Controlled Action (Particular Manner)	Post-Approval
Zeemeermin MC3D seismic survey, Browse Basin, Offshore WA	2009/5023	Not Controlled Action (Particular Manner)	Post-Approval
Referral decision			

Title of referral	Reference	Referral Outcome	Assessment Status
Referral decision			
3D Marine Seismic Survey in the offshore northwest Carnarvon Basin	2011/6175	Referral Decision	Completed
3D Seismic Survey	2008/4219	Referral Decision	Completed
Bianchi 3D Marine Seismic Survey, Carnavon Basin, WA	2013/7078	Referral Decision	Completed
CVG 3D Marine Seismic Survey	2012/6270	Referral Decision	Completed
Enfield 4D Marine Seismic Surveys, Production Permit WA-28-L	2005/2370	Referral Decision	Completed
Mardie Salt Project, Pilbara region, WA	2018/8183	Referral Decision	Completed
Outer Harbour Development and associated marine and terrestial infrastructure	2008/4148	Referral Decision	Completed
Rose 3D Seismic acquisition survey	2008/4220	Referral Decision	Completed
Stybarrow Baseline 4D Marine Seismic Survey (Permit Areas WA-255-P, WA-32-L, WA-	2008/4165	Referral Decision	Completed
Two Dimensional Transition Zone Seismic Survey - TP/7 (R1)	2010/5507	Referral Decision	Completed
Varanus Island Compression Project	2012/6698	Referral Decision	Completed

Key Ecological Features

[Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Ancient coastline at 125 m depth contour	North-west
Ancient coastline at 90-120m depth	South-west
Canyons linking the Argo Abyssal Plain with the Scott Plateau	North-west
Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula	North-west
Commonwealth waters adjacent to Ningaloo Reef	North-west

Name	Region
Continental Slope Demersal Fish Communities	North-west
Exmouth Plateau	North-west
Glomar Shoals	North-west
Mermaid Reef and Commonwealth waters surrounding Rowley Shoals	North-west
Perth Canyon and adjacent shelf break, and other west coast canyons	South-west
Wallaby Saddle	North-west
Western demersal slope and associated fish communities	South-west
Western rock lobster	South-west

Biologically Important Areas		[Resource Information]
Scientific Name	Behaviour	Presence
Dugong		
Dugong dugon Dugong [28]	Breeding	Known to occur
Dugong dugon Dugong [28]	Calving	Known to occur
Dugong dugon Dugong [28]	Foraging	Likely to occur
Dugong dugon Dugong [28]	Foraging (high density seagrass beds)	Known to occur
Dugong dugon Dugong [28]	Nursing	Known to occur
Marine Turtles		
Caretta caretta Loggerhead Turtle [1763]	Foraging	Known to occur
Caretta caretta Loggerhead Turtle [1763]	Internesting buffer	Known to occur
Caretta caretta Loggerhead Turtle [1763]	Nesting	Known to occur

Scientific Name	Behaviour	Presence
Chelonia mydas Green Turtle [1765]	Aggregation	Known to occur
Chelonia mydas Green Turtle [1765]	Basking	Known to occur
Chelonia mydas Green Turtle [1765]	Foraging	Likely to occur
Chelonia mydas Green Turtle [1765]	Foraging	Known to occur
Chelonia mydas Green Turtle [1765]	Internesting	Known to occur
Chelonia mydas Green Turtle [1765]	Internesting buffer	Known to occur
Chelonia mydas Green Turtle [1765]	Mating	Known to occur
Chelonia mydas Green Turtle [1765]	Migration corridor	Known to occur
Chelonia mydas Green Turtle [1765]	Nesting	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Foraging	Likely to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Foraging	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Internesting	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Internesting buffer	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Mating	Known to occur
Eretmochelys imbricata Hawksbill Turtle [1766]	Migration corridor	Known to occur

Scientific Name	Behaviour	Presence
Eretmochelys imbricata Hawksbill Turtle [1766]	Nesting	Known to occur
Natator depressus Flatback Turtle [59257]	Aggregation	Known to occur
Natator depressus Flatback Turtle [59257]	Foraging	Known to occur
Natator depressus Flatback Turtle [59257]	Internesting	Known to occur
Natator depressus Flatback Turtle [59257]	Internesting buffer	Known to occur
Natator depressus Flatback Turtle [59257]	Mating	Known to occur
Natator depressus Flatback Turtle [59257]	Migration corridor	Known to occur
Natator depressus Flatback Turtle [59257]	Nesting	Known to occur
River shark		
Pristis clavata Dwarf Sawfish [68447]	Foraging	Known to occur
Pristis clavata Dwarf Sawfish [68447]	Nursing	Known to occur
Pristis clavata Dwarf Sawfish [68447]	Pupping	Known to occur
Pristis pristis Largetooth Sawfish [60756]	Foraging	Known to occur
Pristis pristis Largetooth Sawfish [60756]	Pupping	Likely to occur
Pristis zijsron Green Sawfish [68442]	Foraging	Known to occur

Scientific Name	Behaviour	Presence
Pristis zijsron Green Sawfish [68442]	Nursing	Known to occur
Pristis zijsron Green Sawfish [68442]	Pupping	Known to occur
Seabirds		
Anous stolidus Common Noddy [825]	Foraging (provisioning young)	Known to occur
Anous tenuirorstris melanops Australian Lesser Noddy [26000]	Foraging (provisioning young)	Known to occur
Ardenna pacifica Wedge-tailed Shearwater [84292]	Foraging (in high numbers)	Known to occur
Ardenna tenuirostris Short-tailed Shearwater [84292]	Breeding	Known to occur
Fregata ariel Lesser Frigatebird [1012]	Breeding	Known to occur
Onychoprion anaethetus Bridled Tern [82845]	Foraging (in high numbers)	Known to occur
Onychoprion fuscata Sooty Tern [82847]	Foraging	Known to occur
Pelagodroma marina White-faced Storm-petrel [1016]	Foraging (in high numbers)	Known to occur
Phaethon lepturus White-tailed Tropicbird [1014]	Breeding	Known to occur
Puffinus assimilis tunneyi Little Shearwater [59363]	Foraging (in high numbers)	Known to occur

Scientific Name	Behaviour	Presence
Sterna dougallii Roseate Tern [817]	Breeding	Known to occur
Sterna dougallii Roseate Tern [817]	Foraging (provisioning young)	Known to occur
Sterna dougallii Roseate Tern [817]	Resting	Known to occur
Sternula albifrons sinensis Little Tern [82850]	Breeding	Known to occur
Sternula albifrons sinensis Little Tern [82850]	Resting	Known to occur
Sternula nereis Fairy Tern [82949]	Breeding	Known to occur
Sula leucogaster Brown Booby [1022]	Breeding	Known to occur
Thalasseus bengalensis Lesser Crested Tern [66546]	Breeding	Known to occur
Sharks		
Rhincodon typus Whale Shark [66680]	Foraging	Known to occur
Rhincodon typus Whale Shark [66680]	Foraging (high density prey)	Known to occur
Whales		
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Foraging	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Known Foraging Area	Known to occur
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Migration	Known to occur

Scientific Name	Behaviour	Presence
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur
Megaptera novaeangliae Humpback Whale [38]	Resting	Known to occur

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix D Aboriginal Cultural Heritage Inquiry System (ACHIS) Report

Aboriginal Cultural Heritage Inquiry System

List of Aboriginal Cultural Heritage (ACH) Register

Search Criteria

283 Aboriginal Cultural Heritage (ACH) Register in Shapefile - P100489_LOWC_EMBA_GDA2020MGAZ50

Disclaimer

Aboriginal heritage holds significant value to Aboriginal people for their social, spiritual, historical, scientific, or aesthetic importance within Aboriginal traditions, and provides an essential link for Aboriginal people to their past, present and future. In Western Australia Aboriginal heritage is protected under the *Aboriginal Heritage Act 1972*.

All Aboriginal cultural heritage in Western Australia is protected, whether or not the ACH has been reported or exists on the Register.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Planning, Lands and Heritage by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you provide the details to the Department via https://achknowledge.dplh.wa.gov.au/ach-enquiry-form and we will make every effort to rectify it as soon as possible.

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Terminology

ID: ACH on the Register is assigned a unique ID by the Department of Planning, Lands and Heritage using the format: ACH-00000001. For ACH on the former Register the ID numbers remain unchanged and use the new format. For example the ACH ID of the place Swan River was previously '3536' and is now 'ACH-00003536'.

Access and Restrictions:

- **Boundary Reliable (Yes/No):** Indicates whether to the best knowledge of the Department, the location and extent of the ACH boundary is considered reliable.
- **Boundary Restricted = No:** Represents the actual location of the ACH as understood by the Department..
- **Boundary Restricted = Yes:** To preserve confidentiality the exact location and extent of the place is not displayed on the map. However, the shaded region (generally with an area of at least 4km²) provides a general indication of where the ACH is located. If you are a landowner and wish to find out more about the exact location of the place, please contact the Department of Planning, Lands and Heritage.
- **Culturally Sensitive = No:** Availability of information that the Department of Planning, Lands and Heritage holds in relation to the ACH is not restricted in any way.
- **Culturally Sensitive = Yes:** Some of the information that the Department of Planning, Lands and Heritage holds in relation to the ACH is restricted if it is considered culturally sensitive information. This information will only be made available if the Department of Planning, Lands and Heritage receives written approval from the people who provided the information. To request access please contact via https://achknowledge.dplh.wa.gov.au/ach-enquiry-form.
- **Culturally Sensitive Nature:**
  - **No Gender / Initiation Restrictions:** *Anyone* can view the information.
  - **Men only:** Only *males* can view restricted information.
  - **Women only:** Only *females* can view restricted information.

Status:

- **Register:** Aboriginal cultural heritage places that are assessed as meeting Section 5 of the *Aboriginal Heritage Act 1972*.
- **Lodged:** Information which has been received in relation to an Aboriginal cultural heritage place, but is yet to be assessed under Section 5 of the *Aboriginal Heritage Act 1972.*
- **Historic:** Aboriginal heritage places assessed as not meeting the criteria of Section 5 of the *Aboriginal Heritage Act 1972*. Includes places that no longer exist as a result of land use activities with existing approvals.

Place Type: The type of Aboriginal cultural heritage place. For example an artefact scatter place or engravings place.

Legacy ID: This is the former unique number that the former Department of Aboriginal Sites assigned to the place.

Aboriginal Cultural Heritage Inquiry System

List of Aboriginal Cultural Heritage (ACH) Register

ID	Name	Boundary Restricted	Boundary Reliable	Culturally Sensitive	Culturally Sensitive Nature	Status	Place Type	Knowledge Holders	Legacy ID
508	POINT MURAT 03	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07503
560	ROEBOURNE MIDDEN	No	No	No	No Gender / Initiation Restrictions	Register	Midden	*Registered Knowledge Holder names available from DPLH	P07498
563	POINT MURAT 01	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07501
564	POINT MURAT 02	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07502
628	CAMP THIRTEEN BURIAL	No	Yes	No	No Gender / Initiation Restrictions	Register	Burial	*Registered Knowledge Holder names available from DPLH	P07434
678	NYARTAWKA NYUKA	No	Yes	No	No Gender / Initiation Restrictions	Register	Ritual / Ceremonial	*Registered Knowledge Holder names available from DPLH	P07391
873	MONTEBELLO IS: NOALA CAVE.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden; Rock Shelter	*Registered Knowledge Holder names available from DPLH	P07287
911	40 MILE - EASTERN POINT	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07271
912	40 MILE - EASTERN DUNES	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Grinding areas / Grooves; Midden	*Registered Knowledge Holder names available from DPLH	P07272
919	ENDERBY IS.27: GOODWYN VIEW	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07279
925	MOUNT BEACH DUNE	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07285
926	MONTEBELLO IS: HAYNES CAVE.	No	Yes	No	No Gender / Initiation Restrictions	Register	Sub surface cultural material; Artefacts / Scatter; Midden; Rock Shelter	*Registered Knowledge Holder names available from DPLH	P07286
927	ENDERBY IS.16: WHITE BASIN	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07233
929	ENDERBY IS.18: MANGROVE CK	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Quarry	*Registered Knowledge Holder names available from DPLH	P07235
930	ENDERBY IS.19: MANGROVE CK	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter	*Registered Knowledge Holder names available from DPLH	P07236
931	ENDERBY IS.20: MANGROVE CK	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07237
932	ENDERBY IS.21: BACK QUARRY	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Quarry	*Registered Knowledge Holder names available from DPLH	P07238

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933	ENDERBY IS.22: TEREBRALIA	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07239
934	ENDERBY IS.23: GRINDING	No	No	No	No Gender / Initiation Restrictions	Register	Engraving; Grinding areas / Grooves	*Registered Knowledge Holder names available from DPLH	P07240
936	ENDERBY IS.25: DINGHY MIDDEN	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07242
937	ENDERBY IS.26: NORTH POINT	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden; Quarry	*Registered Knowledge Holder names available from DPLH	P07243
966	ROSEMARY IS.11: CHOOKIE BAY	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07219
967	ROSEMARY IS.12: CHOOKIE BAY	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Quarry	*Registered Knowledge Holder names available from DPLH	P07220
968	ROSEMARY IS.13	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Grinding areas / Grooves; Midden	*Registered Knowledge Holder names available from DPLH	P07221
969	ROSEMARY IS.14	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Grinding areas / Grooves; Midden	*Registered Knowledge Holder names available from DPLH	P07222
970	ROSEMARY IS.15: AIRSTRIP	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Grinding areas / Grooves; Midden	*Registered Knowledge Holder names available from DPLH	P07223
971	ROSEMARY IS.16: AIRSTRIP	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden; Quarry	*Registered Knowledge Holder names available from DPLH	P07224
972	ROSEMARY IS.17: AIRSTRIP	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Quarry	*Registered Knowledge Holder names available from DPLH	P07225
973	ROSEMARY IS.18: DEEP WATER	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07226
974	ROSEMARY IS.19: CHITON	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07227
975	ROSEMARY IS.20: HALFWAY CK	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07228
977	ROSEMARY IS.22	No	No	No	No Gender / Initiation Restrictions	Register	Engraving; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P07230
978	ROSEMARY IS.23: WADJURU R/H	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Grinding areas / Grooves; Traditional Structure; Midden; Water Source	*Registered Knowledge Holder names available from DPLH	P07231
979	ROSEMARY IS.24: HUNGERFORD	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07232

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1062	LEGENDRE 11	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter	*Registered Knowledge Holder names available from DPLH	P07204
1103	LEGENDRE HILL	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07193
1104	LEGENDRE 01.	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Shell; Water Source	*Registered Knowledge Holder names available from DPLH	P07194
1105	LEGENDRE 02	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07195
1106	LEGENDRE 03.	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Shell	*Registered Knowledge Holder names available from DPLH	P07196
1109	LEGENDRE 06.	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Shell	*Registered Knowledge Holder names available from DPLH	P07199
1110	LEGENDRE 07.	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Shell	*Registered Knowledge Holder names available from DPLH	P07200
1112	LEGENDRE 09.	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Shell	*Registered Knowledge Holder names available from DPLH	P07202
1113	LEGENDRE 10.	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Rock Shelter; Shell	*Registered Knowledge Holder names available from DPLH	P07203
5946	WEST INTERCOURSE ISLAND 11	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P07153
5999	WEST INTERCOURSE ISLAND 09.	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Water Source	*Registered Knowledge Holder names available from DPLH	P07151
6000	WEST INTERCOURSE ISLAND 10	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07152
6022	BEAGLE BEACH 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P07120
6023	WRECK POINT, DEPUCH ISLAND	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Traditional Structure; Midden	*Registered Knowledge Holder names available from DPLH	P07121
6044	DEPUCH IS: NARROW GORGE.	No	No	No	No Gender / Initiation Restrictions	Register	Engraving; Grinding areas / Grooves; Shell; Water Source	*Registered Knowledge Holder names available from DPLH	P07091
6078	ROSEMARY ISLAND 10	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P07019
6079	ENDERBY ISLAND 12	No	Yes	No	No Gender / Initiation Restrictions	Register	Traditional Structure	*Registered Knowledge Holder names available from DPLH	P07020

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6080	ENDERBY ISLAND 13	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P07021
6081	ENDERBY ISLAND 14	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P07022
6082	ENDERBY ISLAND 15	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P07023
6182	EAST LEWIS ISLAND: SW.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Engraving; Midden	*Registered Knowledge Holder names available from DPLH	P06915
6184	ENDERBY ISLAND 09: SE	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Fish Trap; Midden	*Registered Knowledge Holder names available from DPLH	P06917
6185	ENDERBY ISLAND 10: N.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Engraving; Midden; Quarry	*Registered Knowledge Holder names available from DPLH	P06918
6186	ENDERBY ISLAND 11: NE.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Ritual / Ceremonial; Engraving; Grinding areas / Grooves; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P06919
6187	ANGEL ISLAND: NW.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Grinding areas / Grooves; Midden; Rock Shelter	*Registered Knowledge Holder names available from DPLH	P06920
6227	MALUS ISLAND.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Engraving; Grinding areas / Grooves; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P06908
6228	WEST LEWIS ISLAND: SW.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Grinding areas / Grooves; Midden; Other; Quarry; Water Source	*Registered Knowledge Holder names available from DPLH	P06909
6229	WEST LEWIS ISLAND: NW ARM 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Ritual / Ceremonial; Engraving; Grinding areas / Grooves; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P06910
6230	WEST LEWIS ISLAND: NW ARM 2	Yes	Yes	Yes	Men only	Register	Artefacts / Scatter; Ritual / Ceremonial; Engraving; Grinding areas / Grooves; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P06911
6231	WEST LEWIS ISLAND: NE	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving; Fish Trap; Grinding areas / Grooves; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P06912
6232	WEST LEWIS ISLAND: N	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P06913
6233	EAST LEWIS ISLAND: S.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Engraving; Midden	*Registered Knowledge Holder names available from DPLH	P06914

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6311	POINT MURAT.	No	Yes	No	No Gender / Initiation Restrictions	Register	Burial; Artefacts / Scatter; Camp; Midden; Other	*Registered Knowledge Holder names available from DPLH	P06628
6325	COWERIE WELL	Yes	No	Yes	No Gender / Initiation Restrictions	Register	Burial	*Registered Knowledge Holder names available from DPLH	P06642
6334	MUNDA STATION BURIAL 1	No	No	No	No Gender / Initiation Restrictions	Register	Burial	*Registered Knowledge Holder names available from DPLH	P06651
6375	MUD FLATS 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Midden	*Registered Knowledge Holder names available from DPLH	P06586
6376	MUD FLATS 2	No	Yes	No	No Gender / Initiation Restrictions	Register	Midden	*Registered Knowledge Holder names available from DPLH	P06587
6541	URALA STATION WEST	Yes	No	Yes	No Gender / Initiation Restrictions	Register	Ritual / Ceremonial	*Registered Knowledge Holder names available from DPLH	P06438
6567	TABBA TABBA MOUTH 2	No	No	No	No Gender / Initiation Restrictions	Register	Midden	*Registered Knowledge Holder names available from DPLH	P06412
6575	JINTA 1 MIDDEN	Yes	No	Yes	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06370
6596	POINT ANDERSON.	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Hunting Place; Midden; Shell; Water Source	*Registered Knowledge Holder names available from DPLH	P06341
6617	BURUBARLADJI	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Creation / Dreaming Narrative	*Registered Knowledge Holder names available from DPLH	P06362
6618	DEW TALU.	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Ritual / Ceremonial; Water Source	*Registered Knowledge Holder names available from DPLH	P06363
6619	JINTA 1.	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Water Source	*Registered Knowledge Holder names available from DPLH	P06364
6723	MULANDA 2	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06257
6724	MULANDA 3	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06258
6754	OSPREY BAY 6	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06165
6755	OSPREY BAY INTERDUNAL 1	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06166
6757	BLOODWOOD CREEK MIDDEN 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06168

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6758	BLOODWOOD CREEK MIDDEN 2	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06169
6759	BLOODWOOD CREEK MIDDEN 3	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06170
6760	BLOODWOOD CREEK SHORELINE	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06171
6761	LOW POINT MIDDEN	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06172
6762	MILYERING MIDDEN	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06173
6764	CAMP 17 SOUTH MIDDENS	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06175
6765	CAMP 17 NORTH MIDDENS	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06176
6769	MULANDA 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06180
6782	28 MILE CREEK NORTH 1	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06140
6784	MANDU MANDU CREEK SOUTH	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06142
6785	MANDU MANDU CREEK NORTH	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06143
6790	YARDIE CREEK SOUTH 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06148
6799	YARDIE BEACH MIDDEN	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06157
6800	OYSTER STACKS MIDDEN	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06158
6801	NORTH T-BONE BAY	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06159
6802	OSPREY BAY 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06160
6803	OSPREY BAY 2	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06161

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6804	OSPREY BAY 3	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06162
6805	OSPREY BAY 4	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06163
6806	OSPREY BAY 5	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06164
6827	CORAL BAY SKELETON	No	No	No	No Gender / Initiation Restrictions	Register	Burial	*Registered Knowledge Holder names available from DPLH	P06132
6833	WEST MOORE ISLAND	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P06138
6966	ENDERBY ISLAND 08	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P05955
7055	CONZINC BURIAL & MIDDEN	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Burial; Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05882
7083	HARDING MOUTH CAMP.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden; Water Source	*Registered Knowledge Holder names available from DPLH	P05857
7126	MESA CAMP	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05792
7133	ANGEL ISLAND BEACON	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P05799
7203	BAUBOODJOO POINT (Bruboodjoo Midden Site)	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Hunting Place; Midden	*Registered Knowledge Holder names available from DPLH	P05707
7205	TWIN HILL FISHING PLACE.	No	No	No	No Gender / Initiation Restrictions	Register	Hunting Place	*Registered Knowledge Holder names available from DPLH	P05709
7206	WEALJUGOO MIDDEN.	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Hunting Place; Midden	*Registered Knowledge Holder names available from DPLH	P05710
7211	MAUD LANDING.	No	No	No	No Gender / Initiation Restrictions	Register	Burial; Camp; Meeting Place; Water Source	*Registered Knowledge Holder names available from DPLH	P05715
7254	SANDY BAY NORTH	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05652
7265	LAKE SIDE VIEW	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05664
7299	YARDIE CREEK	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05645

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7300	MANDU MANDU CK ROCKSHELTERS	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Artefacts / Scatter	*Registered Knowledge Holder names available from DPLH	P05646
7303	TULKI WELL MIDDEN	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05649
7304	PILGRAMUNNA BAY MIDDEN	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05650
7305	MANGROVE BAY.	No	Yes	No	No Gender / Initiation Restrictions	Register	Burial; Artefacts / Scatter; Hunting Place; Midden	*Registered Knowledge Holder names available from DPLH	P05651
7332	URALA STATION 12	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05574
7382	ROCKY POINT MIDDEN COMPLEX	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05570
7385	URALA STATION 11	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P05573
7786	BAALYINNYE.	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden; Water Source	*Registered Knowledge Holder names available from DPLH	P05055
7859	CAPE LAMBERT BURIAL	No	No	No	No Gender / Initiation Restrictions	Register	Burial	*Registered Knowledge Holder names available from DPLH	P05009
7866	EAST LEWIS MIDDEN 2	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden; Quarry	*Registered Knowledge Holder names available from DPLH	P04966
7899	MALUS ISLAND	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter	*Registered Knowledge Holder names available from DPLH	P04947
7906	DELAMBRE ISLAND SOUTH.	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Water Source	*Registered Knowledge Holder names available from DPLH	P04954
7910	CONZINC ISLAND 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter	*Registered Knowledge Holder names available from DPLH	P04958
7911	CONZINC ISLAND 2	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Quarry	*Registered Knowledge Holder names available from DPLH	P04959
8008	CAPE LAMBERT MIDDEN 01	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P04659
8299	BEADON CREEK	No	Yes	No	No Gender / Initiation Restrictions	Register	Burial; Artefacts / Scatter	*Registered Knowledge Holder names available from DPLH	P04351
8797	POINT SAMSON 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden; Shell	*Registered Knowledge Holder names available from DPLH	P03722

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9488	DRD AREA C-45	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P02696
9735	GIDLEY PASSAGE	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P02447
9736	PASTORAL SETTLEMENT	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P02448
9737	ENDERBY ISLAND 06: BOILER B	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving; Quarry	*Registered Knowledge Holder names available from DPLH	P02449
10058	CAPE LAMBERT DUNE BLOWOUT.	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp	*Registered Knowledge Holder names available from DPLH	P02122
10381	VLAMING HEAD	Yes	No	Yes	No Gender / Initiation Restrictions	Register	Ritual / Ceremonial; Creation / Dreaming Narrative	*Registered Knowledge Holder names available from DPLH	P01799
10578	DAMPIER ARCHIPELAGO 04	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P01576
10582	DAMPIER ARCHIPELAGO	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P01580
10583	DAMPIER ARCHIPELAGO 06	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P01581
10590	DAMPIER ARCHIPELAGO 07	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P01589
10591	DAMPIER ARCHIPELAGO 08	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P01590
10592	DAMPIER ARCHIPELAGO 09	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P01591
10593	DAMPIER ARCHIPELAGO 10	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P01592
10597	DAMPIER ARCHIPELAGO 11	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Midden; Quarry	*Registered Knowledge Holder names available from DPLH	P01596
10626	SEARIPPLE PASSAGE 3	No	No	No	No Gender / Initiation Restrictions	Register	Engraving; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P01571
11328	GAP WELL	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00836
11397	PARDOO 1	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Repository / Storage Place	*Registered Knowledge Holder names available from DPLH	P00747

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11448	23 MILE CREEK	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving	*Registered Knowledge Holder names available from DPLH	P00744
11458	NINGALOO (near)	No	No	No	No Gender / Initiation Restrictions	Register	Painting	*Registered Knowledge Holder names available from DPLH	P00701
11612	DAWSON CREEK BURIAL.	No	No	No	No Gender / Initiation Restrictions	Register	Burial; Artefacts / Scatter; Camp; Midden; Water Source	*Registered Knowledge Holder names available from DPLH	P00529
11624	HUNTERS POOL	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00541
11625	DEPUCH ISLAND	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving; Other	*Registered Knowledge Holder names available from DPLH	P00542
11626	WATERING VALLEY	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P00543
11627	JANE CREEK	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00544
11628	ANCHOR HILL, DEPUCH ISLAND	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00545
11636	PORT HEDLAND SOUTH-WEST	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00553
11639	DOLPHIN LOCATION 6 NO. 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00503
11640	DOLPHIN LOCATION 6 NO. 1	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00504
11641	DOLPHIN LOCATION 7 NO. 3	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00505
11642	DOLPHIN LOCATION 7 NO. 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00506
11643	DOLPHIN LOCATION 7 NO. 1	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00507
11644	DOLPHIN ISLAND EMU	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00508
11645	DOLPHIN LOCATION 8 NO. 3	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00509
11646	DOLPHIN LOCATION 8 NO. 1	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00510

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11647	DOLPHIN LOCATION 8 NO. 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00511
11648	DOLPHIN ISLAND	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00512
11649	DEBBY'S DUNE (DIXON ISLAND 4)	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P00513
11650	GAYLEEN BAY (DIXON IS. 6).	No	No	No	No Gender / Initiation Restrictions	Register	Sub surface cultural material; Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P00514
11653	BOBBY'S FLAT E(DIXON IS.2)	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P00517
11654	BOBBY'S FLAT (DIXON IS. 3)	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P00518
11656	SUSAN BAY (DIXON ISLAND 7)	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P00520
11667	ENZOS LANDING	No	No	No	No Gender / Initiation Restrictions	Register	Engraving; Midden	*Registered Knowledge Holder names available from DPLH	P00479
11668	DOLPHIN LOCATION 3 NO. 3	No	No	No	No Gender / Initiation Restrictions	Register	Engraving; Water Source	*Registered Knowledge Holder names available from DPLH	P00480
11669	DOLPHIN LOCATION 3 NO. 4	No	No	No	No Gender / Initiation Restrictions	Register	Engraving; Water Source	*Registered Knowledge Holder names available from DPLH	P00481
11670	DOLPHIN LOCATION 3 NO. 6	No	No	No	No Gender / Initiation Restrictions	Register	Engraving; Grinding areas / Grooves	*Registered Knowledge Holder names available from DPLH	P00482
11671	DOLPHIN LOCATION 4 NO. 1	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00483
11672	DOLPHIN LOCATION 4 NO. 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00484
11673	DOLPHIN LOCATION 4 NO. 3	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00485
11674	DOLPHIN LOCATION 5 NO. 5	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00486
11675	DOLPHIN LOCATION 5 NO. 4	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00487
11677	NW CORNER POINT 5 (Sea Ripple Rock Art)	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00489

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11683	DOLPHIN LOCATION 5 NO. 1	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00495
11684	DOLPHIN LOCATION 5 NO. 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00496
11685	DOLPHIN LOCATION 5 NO. 3	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00497
11686	TOZER ISLAND	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Fish Trap	*Registered Knowledge Holder names available from DPLH	P00498
11687	DOLPHIN LOCATION 7 NO. 4	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00499
11688	DOLPHIN LOCATION 7 NO. 5	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00500
11689	BOAT PASSAGE 1	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00501
11690	BOAT PASSAGE 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00502
11693	SNAKE POINT, DOLPHIN ISLAND	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00452
11694	DOLPHIN LOCATION 1 NO. 1	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00453
11695	DOLPHIN LOCATION 1 NO. 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00454
11697	DOLPHIN LOCATION 2 NO. 1	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P00456
11698	ANGELA COVE	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving	*Registered Knowledge Holder names available from DPLH	P00457
11699	GIDLEY BAY, GIDLEY ISLAND.	No	No	No	No Gender / Initiation Restrictions	Register	Camp; Engraving	*Registered Knowledge Holder names available from DPLH	P00458
11700	NW CORNER POINT 1	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00459
11701	NW CORNER POINT 3	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00461
11702	EAGLES NEST	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00462

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11703	DOLPHIN ISLAND SW 2a, b	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00463
11704	THREE FISH SITE	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00464
11705	DOLPHIN LOCATION 1 NO. 3	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00465
11706	DOLPHIN ISLAND SW 1	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00466
11707	DOLPHIN LOCATION 2 NO. 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00467
11708	DOLPHIN LOCATION 3 NO. 1	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving	*Registered Knowledge Holder names available from DPLH	P00468
11709	DOLPHIN LOCATION 3 NO. 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00469
11710	DOLPHIN LOCATION 3 NO. 5	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00470
11711	DOLPHIN ISLAND	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00471
11712	MUSEUM BAY, DOLPHIN IS	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00472
11713	LAST ENCOUNTER COVE.	No	No	No	No Gender / Initiation Restrictions	Register	Camp; Engraving	*Registered Knowledge Holder names available from DPLH	P00473
11714	GIDLEY ISLAND	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00474
11715	RIM ROCK GORGE.	No	No	No	No Gender / Initiation Restrictions	Register	Camp; Engraving	*Registered Knowledge Holder names available from DPLH	P00475
11716	NW CORNER POINT 4	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00476
11723	DOLPHIN ISLAND	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00428
11725	NW CORNER POINT 2	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00430
11729	NGARLUMA POINT, GIDLEY IS.	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P00434

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11730	MORS HILL, GIDLEY ISLAND.	No	No	No	No Gender / Initiation Restrictions	Register	Burial; Artefacts / Scatter; Engraving; Shell	*Registered Knowledge Holder names available from DPLH	P00435
11734	ANGEL ISLAND 2	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00440
11735	ANGEL ISLAND 1	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving	*Registered Knowledge Holder names available from DPLH	P00441
11740	NW CORNER BEACH 3	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00446
11744	EAST LEWIS 5	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00395
11745	EAST LEWIS 6	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00396
11746	EAST LEWIS 7	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00397
11747	EAST LEWIS 8	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00398
11748	EAST LEWIS 9	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00399
11749	EAST LEWIS 4	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00400
11750	EAST LEWIS 3	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00401
11753	EAST LEWIS 1	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00404
11759	WEST LEWIS ISLAND	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00410
11767	FISH POINT, GIDLEY ISLAND	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00418
11771	ENDERBY ISLAND 05	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00368
11772	ROSEMARY ISLAND 09	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P00369
11773	ROSEMARY ISLAND 08	No	No	No	No Gender / Initiation Restrictions	Register	Engraving; Grinding areas / Grooves; Traditional Structure	*Registered Knowledge Holder names available from DPLH	P00370

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11774	ROSEMARY ISLAND 07	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00371
11775	ROSEMARY ISLAND 06	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00372
11776	ROSEMARY ISLAND 04.	No	No	No	No Gender / Initiation Restrictions	Register	Camp; Engraving	*Registered Knowledge Holder names available from DPLH	P00373
11777	ROSEMARY ISLAND 03	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00374
11789	ROSEMARY ISLAND 01	No	No	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Midden; Quarry	*Registered Knowledge Holder names available from DPLH	P00386
11792	WEST INTERCOURSE ISLAND 02	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00389
11793	WEST INTERCOURSE ISLAND 03	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00390
11794	WEST INTERCOURSE ISLAND 04	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00391
11795	WEST INTERCOURSE ISLAND 05	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00392
11796	WEST INTERCOURSE ISLAND 01	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00393
11818	ROSEMARY ISLAND 02	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00362
11819	ROSEMARY ISLAND 05	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00363
11820	ENDERBY ISLAND 01	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00364
11821	ENDERBY ISLAND 02	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden	*Registered Knowledge Holder names available from DPLH	P00365
11822	ENDERBY ISLAND 03	No	No	No	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	P00366
11823	ENDERBY ISLAND 04	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Midden	*Registered Knowledge Holder names available from DPLH	P00367
11943	TWO MILE RIDGE, NELSON POINT	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Engraving; Other	*Registered Knowledge Holder names available from DPLH	P00219

ID	Name	Boundary Restricted	Boundary Reliable	Culturally Sensitive	Culturally Sensitive Nature	Status	Place Type	Knowledge Holders	Legacy ID
12071	SOUTH WEST CREEK 4.	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Sub surface cultural material; Artefacts / Scatter; Camp; Ritual / Ceremonial; Engraving; Traditional Structure; Midden; Other	*Registered Knowledge Holder names available from DPLH	P00090
12550	CONDINI LANDING WEST	No	No	No	No Gender / Initiation Restrictions	Register	Burial	*Registered Knowledge Holder names available from DPLH	K02698
12965	CAPE KERAUDREN 3.	Yes	No	Yes	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Camp; Midden; Water Source	*Registered Knowledge Holder names available from DPLH	K02266
12967	CAPE KERAUDREN 5	Yes	No	Yes	No Gender / Initiation Restrictions	Register	Burial; Midden	*Registered Knowledge Holder names available from DPLH	K02268
12968	CAPE KERAUDREN 6	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Grinding areas / Grooves; Midden	*Registered Knowledge Holder names available from DPLH	K02269
12969	WARRA MURRANGA TALU	Yes	No	Yes	No Gender / Initiation Restrictions	Register	Ritual / Ceremonial; Creation / Dreaming Narrative	*Registered Knowledge Holder names available from DPLH	K02270
14341	SHELLBOROUGH 1-3.	Yes	No	Yes	No Gender / Initiation Restrictions	Register	Burial; Artefacts / Scatter; Camp; Grinding areas / Grooves; Traditional Structure; Midden; Other	*Registered Knowledge Holder names available from DPLH	K00773
16216	North West Intercourse Island Site 13	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Grinding areas / Grooves; Shell	*Registered Knowledge Holder names available from DPLH	
16217	North West Intercourse Island Site 36	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Grinding areas / Grooves; Other; Shell	*Registered Knowledge Holder names available from DPLH	
16230	South West Burrup Peninsula Site 63	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Grinding areas / Grooves; Other; Shell	*Registered Knowledge Holder names available from DPLH	
16247	North West Intercourse Island Site 13	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Grinding areas / Grooves; Midden; Shell	*Registered Knowledge Holder names available from DPLH	
16269	North West Intercourse Island Site 12	No	Yes	No	No Gender / Initiation Restrictions	Register	Engraving; Grinding areas / Grooves	*Registered Knowledge Holder names available from DPLH	
16306	North West Intercourse Island Site 51	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Grinding areas / Grooves; Other; Shell	*Registered Knowledge Holder names available from DPLH	
16314	North West Intercourse Island Site 60	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Other	*Registered Knowledge Holder names available from DPLH	
16317	North West Intercourse Island Site 63	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Grinding areas / Grooves; Shell	*Registered Knowledge Holder names available from DPLH	
16597	Baler Bluff	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Midden; Shell	*Registered Knowledge Holder names available from DPLH	

Aboriginal Cultural Heritage Inquiry System

List of Aboriginal Cultural Heritage (ACH) Register

ID	Name	Boundary Restricted	Boundary Reliable	Culturally Sensitive	Culturally Sensitive Nature	Status	Place Type	Knowledge Holders	Legacy ID
17193	Ningaloo Station	No	No	No	No Gender / Initiation Restrictions	Register	Burial	*Registered Knowledge Holder names available from DPLH	
21607	Roller/Skate Site 2	No	Yes	No	No Gender / Initiation Restrictions	Register	Midden; Shell	*Registered Knowledge Holder names available from DPLH	
22874	Marapikurrinya Yintha Site	No	Yes	No	No Gender / Initiation Restrictions	Register	Creation / Dreaming Narrative	*Registered Knowledge Holder names available from DPLH	
26005	Site No. 18	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	
26006	Site No. 25	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Engraving	*Registered Knowledge Holder names available from DPLH	
26453	Burrup Peninsula V34	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter; Engraving; Grinding areas / Grooves; Shell	*Registered Knowledge Holder names available from DPLH	
26736	ACHM - 09-05	No	Yes	No	No Gender / Initiation Restrictions	Register	Artefacts / Scatter	*Registered Knowledge Holder names available from DPLH	
27561	Sam's Creek Burial Site	Yes	Yes	Yes	No Gender / Initiation Restrictions	Register	Burial	*Registered Knowledge Holder names available from DPLH	
29198	CL10ENG16	Yes	Yes	Yes	Men only	Register	Engraving	*Registered Knowledge Holder names available from DPLH	
32041	PIL3381	No	Yes	No	No Gender / Initiation Restrictions	Register	Midden; Shell	*Registered Knowledge Holder names available from DPLH	
32879	Lower Fortescue River (Mardathuni)	No	No	No	No Gender / Initiation Restrictions	Register	Camp; Creation / Dreaming Narrative; Hunting Place; Landscape / Seascape Feature; Plant Resource; Water Source	*Registered Knowledge Holder names available from DPLH	
37522	Mindurru (Ashburton River)	Yes	Yes	Yes		Register	Creation / Dreaming Narrative	*Registered Knowledge Holder names available from DPLH	
38533	Cape Bruguieres Channel	No	Yes	No		Register	Artefacts / Scatter	*Registered Knowledge Holder names available from DPLH	
38628	Flying Foam Passage submerged freshwater spring	No	Yes	No		Register	Artefacts / Scatter	*Registered Knowledge Holder names available from DPLH	

Appendix E Exploration and Survey Operations Oil Pollution Emergency Plan (OPEP) [AUPD24001-VOG-1100-YH-0016]

VERMILION
Oil & Gas
Australia Pty. Ltd.

VERMILION OIL & GAS AUSTRALIA

EXPLORATION AND SURVEY OPERATIONS OIL POLLUTION EMERGENCY PLAN

AUPD24001-VOG-1100-YH-0016

Revision	Date	Originator	Checker	Approver
0	24 March 2025	Social Resources	Environmental Advisor	Managing Director

Revision History

Revision	Date	Description	Originator	Checker	Approver
0	24 March 2025	For Use	MW	MJ	RC

Distribution List

Copy no.	Position
1	Master copy – VOGA Document Control
2	VOGA Managing Director
3	VOGA Operations Manager
4	VOGA HSES Advisor
5	Wandoo Field Superintendent
6	VOGA Incident Commander
7	ICT Planning Chief
8	ICT Logistics Chief
9	ICT Finance Chief
10	ICT Operations Chief
11	ICT Safety Officer
12	ICT Stakeholder Liaison Officer
13	ICT Public Information Officer
14	Vermilion Corporate Command Operations Team
15	VOGA Well Construction QHSE Advisor
16	VOGA Environmental Advisor
17	MODU Offshore Installation Manager
18	Manager Assessment and Compliance NOPSEMA – Perth
19	AMOSC
20	DoT Oil Spill Response Coordinator

Table of Contents

Abbreviations and Acronyms

°C	degrees Celsius
AAC	Aerial Attack Coordinator
ADIOS	Automated Data Inquiry for Oil Spills
AIIMS	Australasian Inter-Service Incident Management System
ALARP	as low as reasonably practicable
AMOSC	Australian Marine Oil Spill Centre
AMOS Plan	Australian Marine Oil Spill Plan
AMSA	Australian Maritime Safety Authority
APASA	Asia Pacific Applied Science Associates Pty Ltd
APPEA	Australian Petroleum Production and Exploration Association
BAOAC	Bonn Agreement Oil Appearance Code
bbl	barrels
BER	boom encounter rate
BoM	Bureau of Meteorology
BOP	blowout preventer
CALM Buoy	Catenary Anchor Leg Mooring Buoy
CAMBA	China-Australia Migratory Bird Agreement
CCT	Corporate Command Team
cm	centimetres
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety
DFAT	Department of Foreign Affairs and Trade
DoF	Department of Fisheries
DOR	dispersant-to-oil ratio
DoT	Department of Transport
EMBA	environment that may be affected
EP	Environment Plan
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ERP	Emergency Response Plan
ESC	Environmental and Scientific Coordinator
FWADC	fixed wing aerial dispersant capability
g/m^2	grams per square metre
GIS	Geographic Information System
GSI	Great Sandy Island
HFO	heavy fuel oil

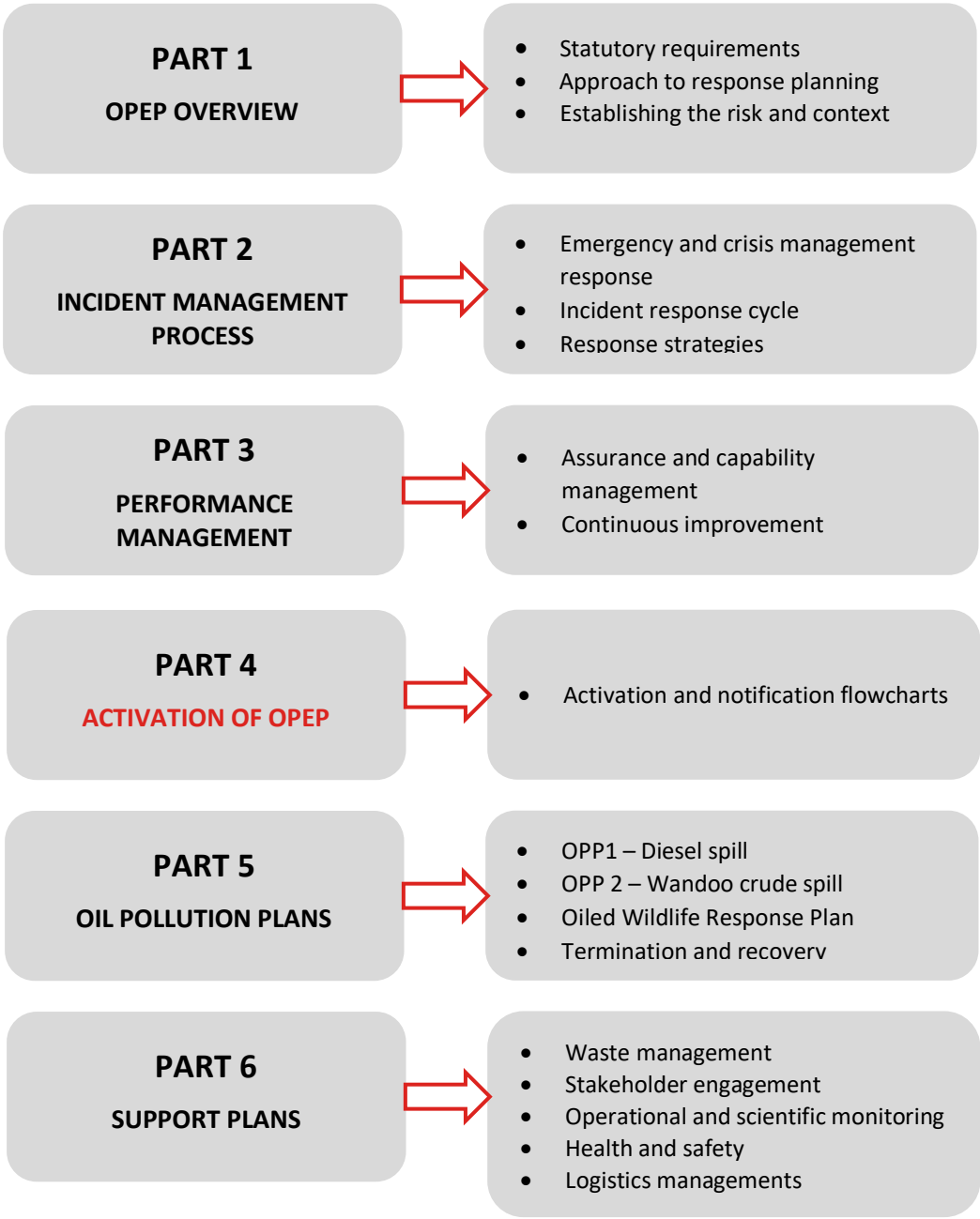
HMA	Hazard Management Agency
h	hour(s)
HSES	Health, Safety, Environment and Security
HSE MS	Health, Safety and Environment Management System
IAP	Incident Action Plan
IBC	intermediate bulk container
IC	Incident Commander
ICC	Incident Command Centre
ICT	Incident Command Team
IMO	International Maritime Organisation
IMT	Incident Management Team
JAMBA	Japan-Australia Migratory Bird Agreement
JHA	job hazard analysis
JIP	Joint Industry Practice
JSCC	Joint Strategic Coordination Committee
kg	kilograms
kg/m^3	kilograms per cubic metre
km	kilometres
KPI	key performance indicator
m	metres
m^2	square metre(s)
m^3	cubic metre(s)
mm	millimetres
MBI	Montebello Islands
MEE	Maritime Environmental Emergencies
MEER Unit	Maritime Environmental Emergency Response Unit (within WA Department of Transport)
MODU	Mobile Offshore Drilling Unit
MOU	Memorandum of Understanding
National Plan	National Plan for Maritime Environmental Emergencies
NDVI	Normalised Difference Vegetation Index
NEBA	net environmental benefit analysis
NES	national environmental significance
nm	nautical mile
NOPSEMA	National Offshore Petroleum, Safety and Environmental Management Authority
NRT	National Response Team
NWS	North-West Shelf
OH&S	Occupational Health and Safety
OMP	Operational Monitoring Plan
OPEP	Oil Pollution Emergency Plan

OPGGSA	*Offshore Petroleum and Greenhouse Gas Storage Act 2006*
OPGGS(E)R	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009
OPICC	Offshore Petroleum Incident Coordination Committee
OPP	Oil Pollution Plan
OPRC	Oil Pollution Preparedness, Response and Cooperation
OPRC	International Convention on Oil Pollution Preparedness, Response and Cooperation 1990
OSCA	Oil Spill Control Agents (Register)
OSM	Operational and Scientific Monitoring
OSM BIP	Operational and Scientific Monitoring Bridging Implementation Plan
OSMP	Operational and Scientific Monitoring Plan
OSR	Oil Spill Response
OSRA	Oil Spill Response Atlas or Agency
OSRL	Oil Spill Response Limited
OSRO	Oil Spill Response Organisation(s)
OSTM	Oil Spill Trajectory Modelling
OWA	Oiled Wildlife Advisor
OWR	Oiled Wildlife Response
OWERP	Oiled Wildlife Emergency Response Plan
OWRP	Oiled Wildlife Response Plan
PEAR	People, Environment, Assets and Reputation
PIC	Person in Charge
POB	persons on-board
POLREP	Pollution Report (Form)
POWRP	Pilbara Region Oiled Wildlife Response Plan
PPE	personal protective equipment
ppb	parts per billion
ppm	parts per million
psi	pounds per square inch = 0.068 atmospheres
P(SL)A	*Petroleum (Submerged Lands) Act 1982*
Ref	reference
ROV	remotely operated vehicle
SCAT	Shoreline Clean-up Assessment Technique
SDS	safety data sheet
SIMA	Spill Impact Mitigation Assessment
SIMOPS	Simultaneous Operations
SITREP	Situation Report (Form)
SMEACS	Situation, Mission, Execution, Administration and Logistics, Command, Control and Communication, Safety
SMEERC	State Marine Environmental Emergency Response Committee
SMOPC	State Marine Oil Pollution Committee

SMP	Scientific Monitoring Plan
SOPEP	Shipboard Oil Pollution Emergency Plan
T	tonnes
TRP	Tactical Response Plan
US	United States
VFR	Visual Flight Rules
VOGA	Vermillion Oil & Gas Australia Pty Ltd
WA	Western Australia
WAMOPRA	Western Australia Marine Oil Pollution Risk Assessment
WAOWRP	Western Australia Oiled Wildlife Response Plan
WestPlan	Western Australian Offshore Petroleum Operations (Exploration and Production) Emergency Management Plan
WestPlan-HAZMAT	Western Australian Hazardous Materials Emergency Management Plan
WestPlan-MOP	Western Australian Marine Oil Pollution Emergency Management Plan

In the event of a spill, go to PART 4

The Exploration and Survey Operations OPEP is divided into six parts:



PART 1: Oil Pollution Emergency Plan Overview

Section 1 – Introduction

1.1 OPEP Aim and Outcomes

The aim of the Vermilion Oil & Gas Australia Pty Ltd (VOGA) Exploration and Survey Operations Oil Pollution Emergency Plan (OPEP) is to ensure that measures are in place to mitigate the oil spill hazards associated with survey and exploration activities.

To achieve this, the Exploration and Survey Operations OPEP has established the following outcomes based on the following requirements:

- **Outcome 1:** The Exploration and Survey Operations OPEP is established to mitigate the oil spill hazards identified in the respective Environment Plans (EPs).
- **Outcome 2:** Response strategies provided in the Exploration and Survey Operations OPEP are appropriate to:
  - the nature and scale and associated environmental impact of the potential spill hazards
  - the nature and scale and associated environmental impact of the potential spill response strategies
  - the environmental sensitivities and priorities as outlined within the respective EP.
- **Outcome 3:** The Exploration and Survey Operations OPEP describes incident management system and interfaces.
- **Outcome 4:** Decision-making processes support mitigation of environmental impact of spills and assessment of effectiveness of response strategies using:
  - the Incident Action Plan (IAP) which includes a consideration for environmental impact of spill and response
  - operational and scientific monitoring (OSM).
- **Outcome 5:** The Exploration and Survey Operations OPEP shall contain processes to assess, test and maintain arrangements to meet the outcomes of the OPEP through:
  - assurance processes
  - capability assessment
  - review triggers.

These outcomes align with the VOGA Critical Procedure Performance Standard for Element 8 – Oil Spill Response [WAN-WNAB-CP-ER-02 and WAN-WNAB-CP-ER-03] key requirements.

There are six parts to the OPEP:

- Part 1 – an overview of the Exploration and Survey Operations OPEP
- Part 2 – the VOGA incident management process
- Part 3 – the management arrangements for the Exploration and Survey Operations OPEP
- Part 4 – notification and activation requirements

- Part 5 – Oil Pollution Plans (OPPs) detailing response strategies and arrangements for credible spill scenarios
- Part 6 – spill response support plans.

1.2 Scope

This plan has been established by VOGA to respond to oil pollution associated with survey and exploration drilling activities within Permit Area WA-14-L (Section 1.3).

The Exploration and Survey Operations OPEP includes organisational responsibilities, actions, reporting requirements and resources available to ensure the effective and timely management of the response to an accidental oil spill resulting from exploration activities. OPEP requirements and corresponding sections where these requirements are addressed are outlined in Table 1-1.

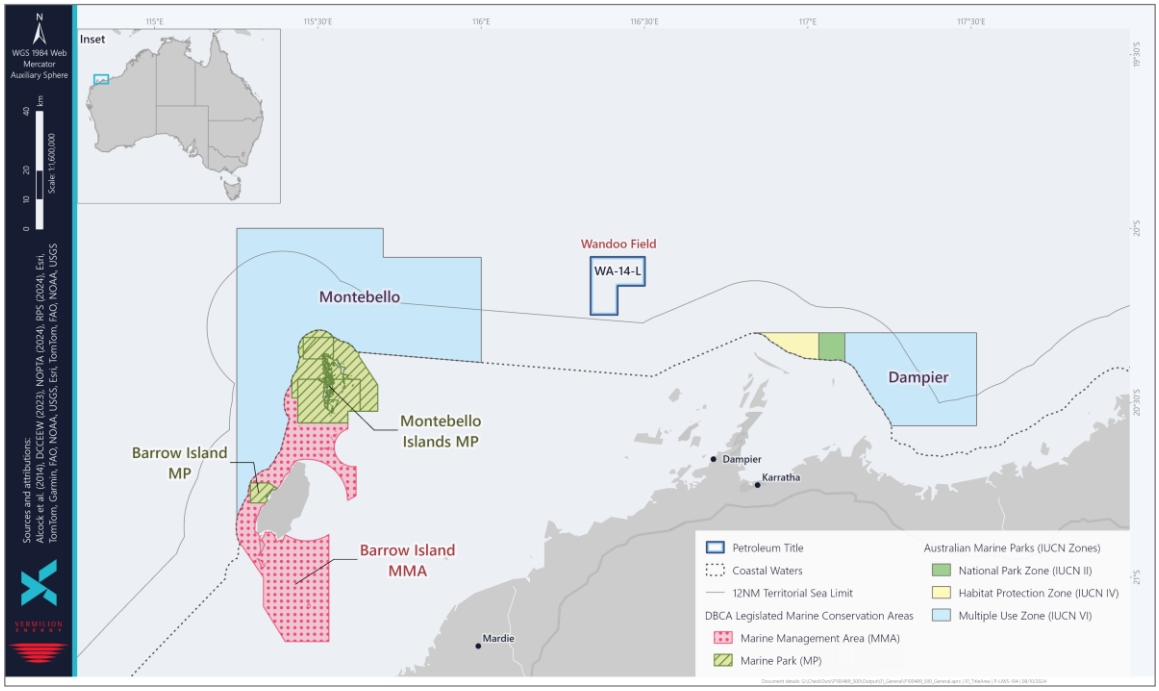
Table 1-1: Scope of OPEP

Description of OPGGS(E)R requirements for OPEP	Part in OPEP
The oil pollution emergency plan must include adequate arrangements for responding to and monitoring oil pollution.	Part 5 and 6
The implementation strategy must include arrangements for testing the response arrangements in the oil pollution emergency plan that are appropriate to the response arrangements and to the nature and scale of the risk of oil pollution for the activity.	Part 3
The arrangements for testing the response arrangements must include: (a) a statement of the objectives of testing (b) a proposed schedule of tests (c) mechanisms to examine the effectiveness of response arrangements against the objectives of testing (d) mechanisms to address recommendations arising from tests.	Part 3
The proposed schedule of tests must provide for testing the response arrangements.	Part 3
The implementation strategy must provide for monitoring of impacts to the environment from oil pollution and response activities.	Part 6 and Appendix B
The implementation strategy must include information demonstrating that the response arrangements in the OPEP are consistent with the national system for oil pollution preparedness and response.	Part 1 and 3

1.3 Location

Permit WA-14-L is situated approximately 80 km northwest of the port of Dampier (Figure 1-1) with water depths ranging from approximately 50–60 m below Lowest Astronomical Tide (LAT).

Figure 1-1: Wandoo Field location

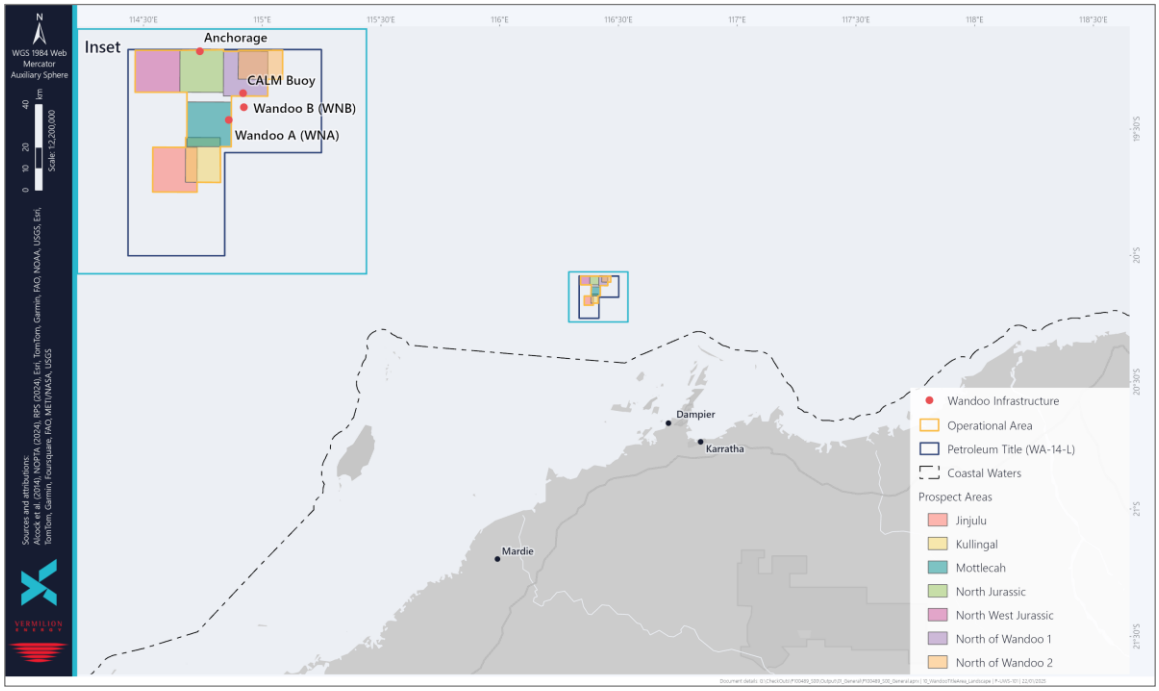


Indicative coordinates for the exploration prospects and survey areas are provided in Table 1-2 and illustrated in Figure 1-2.

Table 1-2: Indicative geographical coordinates of the exploration prospects

Prospects	X (Easting)	Y (Northing)	Latitude	Longitude
Kullingal	437843.0	7769379.0	20.171952275° S	116.405154118° E
Mottlecah	439263.0	7773031.5	20.138993472° S	116.418865226° E
Jinjulu	435158.7	7769128.6	20.174126078° S	116.379457185° E
North of Wandoo 1	441024.0	7777050.0	20.102736571° S	116.435844178° E
North of Wandoo 2	442025.0	7778592.0	20.088833157° S	116.445468311° E
Jurassic North	438556.0	7777506.0	20.098539052° S	116.412251940° E
NW Jurassic	431796.0	7777285.0	20.100308831° S	116.347583269° E

Figure 1-2: Operational areas



1.4 Activity Description

This OPEP covers oil spill scenarios from survey and exploration drilling activities within the Permit Area WA-14-L, as described in the Wandoo Field Exploration Drilling EP [AUPD24001-VOG-1100-YH-0015] and Wandoo Field Exploration Drilling EP [AUPD24001-VOG-1100-YH-0015].

1.4.1 Geotechnical and Geophysical Survey Activities

The activities covered in the Wandoo Field Geotechnical and Geophysical Survey EP [AUPD24001-VOG-1100-YH-0015] include:

- Geotechnical survey, including seabed grab sampling and borehole/Piezocone Penetration Tests (PCPTs)
- Geophysical survey, including Multibeam Echo Sounder (MBES), Side Scan Sonar (SSS), Sub-bottom Profiling (SBP) and magnetometer.

Activities excluded from the scope of the EP are:

- Seismic surveys
- Vessel operations within Port Boundaries or State waters, given they are managed under the *Shipping and Pilotage Act 1967* (WA) as administered by the relevant Port Authority under the *Port Authorities Act 1999* (WA)
- Vessel operations within Commonwealth waters outside of the Operational Area, given they are managed under the *Navigation Act 2012* (Cth) as administered by the Australian Maritime Safety Authority (AMSA).

1.4.2 Exploration Drilling Activities

The activities covered in the Wandoo Field Exploration Drilling EP [AUPD24001-VOG-1100-YH-0015] include:

- Using an approved transit route specialist anchor handling vessels will manoeuvre the drilling rig into place
- The drilling rig will be positioned at sites determined as suitable by the seabed assessments
- Surface hole section will be drilled and cased, and then a riser and Blowout Preventer (BOP) to prevent release of hydrocarbons installed
- The well would then be drilled to reach the reservoir
- Once the exploration wells have been drilled and evaluated, they will be Plugged and Abandoned (P&A) so hydrocarbons cannot be released, and all equipment removed from the seabed.

1.5 Interface with Other Plans

1.5.1 VOGA Plans

This Exploration and Survey Operations OPEP interfaces with the following VOGA plans:

- **Wandoo Emergency Response Plan [VOG-2000-RD-0017]** – This plan describes the immediate 'actions-on' for an unplanned emergency incident at one of VOGA's facilities. The Wandoo Emergency Response Plan (ERP) is the plan that will be initially put in place to manage the immediate, life-threatening consequences of an emergency (e.g. fire, collision, etc.) and immediately mitigate, as far as possible, the consequences of these actions. The Wandoo ERP will always have primacy over other plans.
- **Source Control Contingency Plan** – The Source Control Contingency Plan provides a response framework to implement a well construction activity to intercept and plug/kill a well bore in the event of a well blowout. The Source Control Response Team is run independently of the VOGA Oil Spill Incident Command Team (ICT). Both teams interface at the crisis management level of the emergency response structure.
- **Wandoo Field Exploration Drilling EP [AUPD24001-VOG-1100-YH-0015]** – The Exploration Drilling EP caters for all exploration drilling activities associated with the Permit Area. The EP is developed by VOGA and accepted by the Jurisdictional Authority under the Offshore Petroleum and Greenhouse Gas Storage (Environmental) Regulations 2009 (OPGGS(E)R). It identifies the environmental risks and impacts associated with the activities covered within the plan. This OPEP addresses all potential oil spill risks identified in the Wandoo Field Exploration Drilling EP.
- **Wandoo Field Geotechnical and Geophysical Survey EP [AUPD24001-VOG-1100-YH-0014] –** The Geotechnical and Geophysical Survey EP caters for all survey activities associated with the Permit Area. The EP is developed by VOGA and accepted by the Jurisdictional Authority under the OPGGS(E)R. It identifies the environmental risks and impacts associated with the activities covered within the plan. This OPEP addresses all potential oil spill risks identified in the Wandoo Field Geotechnical and Geophysical Survey EP.

- **Oil Spill Response Capability Review [VOG-7000-RH-0009]** – This report provides a capability review for all oil spill response spill scenarios associated with production and well construction activities within the Wandoo Permit Area WA-14-L. The capability assessment included detailing the specification for each resource requirement (e.g. skills, vessels, equipment) and identifying what contracts and arrangements are in place, or required, to meet the resource requirements. The requirements are ascertained and assessed through workshops, surveys and review of existing contracts.
- **Wandoo Field Operational and Scientific Monitoring Bridging Implementation Plan [WAN-2000-RD-0001.04]** – This plan has been designed to interface with the Joint Industry Operational and Scientific Monitoring Framework and associated Oil Spill Response Limited (OSRL) Supplementary Agreement. The Operational and Scientific Monitoring Bridging Implementation Plan (OSM BIP) is informed by the EP through the identification of the sensitive receptors in the Wandoo Field operating environment that could be impacted during an oil spill.

1.5.2 Government and Industry Plans

This OPEP interfaces with the following Australian Government, State Government and Industry plans:

1.5.2.1 Oil Spill Response Organisations (OSRO)

Oil Spill Response Limited (OSRL):

- VOGA has a signed Associate Agreement with OSRL for the Wandoo Production Area
- VOGA is a member of the OSRL Joint Industry Oil Spill Monitoring Supplementary Service
- VOGA has access to the Global Dispersant Stockpile (GDS)
- OSRL has the capacity to provide personnel and equipment to combat Level 3 spills
- Access to international resources is facilitated through the OSRL membership.

Australian Marine Oil Spill Plan (AMOS Plan) (AMOSC, 2021):

- This plan is managed by the Australian Marine Oil Spill Centre (AMOSC), and will be activated by VOGA when the response to an oil spill incident is regarded by VOGA to be requiring resources beyond those of the company
- The plan coordinates the participation of the oil industry in response through the mobilisation of AMOSC personnel and/or equipment, which can be supplemented by personnel and equipment owned directly by other industry companies
- As members of AMOSC, Chevron and Santos will respond with equipment and/or personnel to respond to a VOGA spill impacting on Barrow or Lowendal Islands respectively.

1.5.2.2 Oil Spill Response Agency (OSRA)

National Plan for Maritime Environmental Emergencies (National Plan):

- Administered by the AMSA, the National Plan outlines Australia's arrangements for responding to oil spills in the marine environment, with the aim of protecting against

environmental pollution as a result of oil contamination and, where this is not possible, minimise the effects.

- The National Plan outlines combined stakeholder arrangements designed to allow a rapid and cooperative response to marine oil spills within Australian waters. Once accepted by the National Offshore Petroleum, Safety and Environmental Management Authority (NOPSEMA), the Exploration and Survey Operations OPEP is eligible for National Plan support. For the purposes of the Exploration and Survey Operations OPEP, the National Plan can be used to provide personnel, equipment and technical resources from the Australian and State governments to VOGA for use during a significant oil spill.
- VOGA is a signatory to the AMSA Support for Oil Spill Preparedness and Response Memorandum of Understanding (MOU). AMSA will coordinate the resources of the National Plan on the formal request of the appointed Incident Commander. A liaison officer from AMSA will sit within the VOGA ICT to facilitate the effective and efficient coordination of National Plan resources.
- The Western Australia (WA) Department of Transport (DoT) is a signatory to the inter-governmental agreement under the National Plan. The Oil Spill Response (OSR) Coordinator (Maritime Environmental Emergency Response Unit; MEER Unit), as well as some members of the State Response Team, are members of the National Response Team and are trained and competent in roles ranging from team leader for equipment operations and shoreline response to ICT roles. The MEER Unit has access to AMSA's National Plan equipment to respond to spills in State waters. This equipment is located in Dampier and Fremantle.

WA State Hazard Plan – Maritime Environmental Emergencies (MEE):

- In accordance with the *Emergency Management Act 2005*, the MEE has been formulated by the Hazard Management Agency (HMA) and approved by the WA State Emergency Management Committee (SEMC).
- The State Hazard Plan – MEE prescribes the management arrangements for the prevention of, preparation for, response to and recovery from a MEE emergency in order to minimise the impacts of marine oil pollution from vessels, offshore petroleum activities and other sources in State waters.
- For the purposes of the Exploration and Survey Operations OPEP, State Hazard Plan - MEE describes the response arrangements that the WA State Government will put in place for oil spills from the Wandoo Field, should they enter, or be predicted to enter, State waters and any shorelines or wildlife therein. This includes performing the function of Controlling Agency for response activities in State waters resulting from Level 2/3 incident in Australian Government waters as per the WA DoT Offshore Petroleum Industry Guidance Note Marine Oil Pollution (MOP): Response and Consulation Arrangements (September 2018).

WA DoT OPEP:

- This OPEP describes the activities and actions that the WA DoT will undertake to mount a credible and proportionate response to oil pollution in State waters. For the purposes of the Exploration and Survey Operations OPEP, the DoT OPEP is complimentary in that it will be used to assist and guide the actions and activities that take place in State waters by the DoT in response to a spill from the Wandoo Field.

- The DoT MEER Unit will work with the VOGA to determine protection priorities and undertake an initial and ongoing environmental impact assessments to determine the most appropriate response in State waters. These protection priorities determined at the time of a spill may differ from those originally identified in the accepted OPEP. Dispersant use in and around State waters must be approved by either DoT or the Department of Mines and Petroleum – see DoT's Dispersant Use Guidelines for further information.
- The MEER Unit chairs the State Marine Environmental Emergency Response Committee (SMEERC) which has representation from all agencies and authorities involved in marine OSR (refer to WestPlan-MOP for a list of membership). In the event of a spill with any potential to impact State waters, DoT will coordinate the notification of all representatives on the SMEERC. This includes the State Environmental and Scientific Coordinator.

1.5.2.3 Third Party Vessels

Shipboard Oil Pollution Emergency Plans (SOPEPs):

- These plans contain details about the ship, roles and responsibilities in the event of a spill, and spill response equipment on board. MARPOL 73/78 requires that every oil tanker of 150 tonnes gross tonnage and above, and every ship other of 400 gross tonnes and above, carry a SOPEP approved by the Administration. It is the same Shipboard Marine Pollution Plan that is required under the Oil Pollution Preparedness, Response and Cooperation (OPRC) Convention.
- Shipboard Marine Pollution Plans also include noxious liquid substances and should more correctly be called "Shipboard Marine Pollution Emergency Plan". The plans must be prepared in accordance with vessel class and flag State requirements and guidelines as laid down by the International Maritime Organisation (IMO).
- For the purposes of this OPEP, all vessels that are involved in the activity will implement their SOPEP to assist in mitigating any spills from their shipping activities, which contributes to the mitigation of the overall oil spill risk from the petroleum activity.

1.6 Response Priorities

Consistent with the National Plan, the priorities for VOGA in responding to an oil spill will be:

- Human health and safety
- Habitat and cultural resources
- Rare and/or endangered flora and fauna
- Commercial resources (including commercial fisheries, other offshore oil and gas production and exploration facilities in the immediate surrounds)
- Community amenities for social and recreational activities (including recreational fishing, local beaches and culturally sensitive areas).

1.7 Incident Classification

The AMSA National Plan and the WA State Hazard Plan – MEE assign response levels to oil spills according to the criteria listed in Table 1-3.

The Wandoo ERP [VOG-2000-RD-0017] provides details on the response arrangements and responsibilities VOGA has for the management of emergencies which may occur during survey and drilling operations. Consistent with the National Plan, the Wandoo ERP categorises incidents in relation to the response required:

- **Level 1 incidents**: Generally able to be resolved through the application of local or initial resources only (e.g. first strike response).
- **Level 2 incidents**: More complex in size, duration, resource management and risk and may require deployment of jurisdictional resources beyond the initial response.
- **Level 3 incidents**: Characterised by a degree of complexity that requires the Incident Commander to delegate all incident management functions to focus on strategic leadership and response coordination and may be supported by national and international resources.

Table 1-3: Emergency classification levels (AMSA and WA DoT)

Characteristic	Level 1	Level 2	Level 3
Management			
Jurisdiction	Single jurisdiction	Multiple jurisdictions	Multiple jurisdictions
Delegation	Incident Controller responsible for all functions	Some functions delegated or divisions created	All functions delegated and/or divisions created
Number of agencies	First-response agency	Routine multi-agency response	Agencies from across government and industry
IAP	Simple/outline	Outline	Detailed
Resources	Resourced from within one area	Requires intra-state resources	Requires national or international resources
Type of emergency			
Type of response	First-strike	Escalated	Campaign
Duration	Single shift	Multiple shifts Days to weeks	Extended response Weeks to months
Hazards	Single hazard	Single hazard	Multiple hazards
Resources at risk			
Human	Potential for serious injuries	Potential for loss of life	Potential for multiple loss of life
Environment	Isolated impacts or with natural recovery expected within weeks	Significant impacts and recovery may take months. Remediation required	Significant area and recovery may take months. Remediation required
Wildlife	Individual fauna	Groups of fauna or threatened fauna	Large numbers of fauna
Economy	Business level disruption	Business failure	Disruption to a sector
Social	Reduced services	Ongoing reduced services	Reduced quality of life
Infrastructure	Short-term failure	Medium-term failure	Severe impairment
Public affairs	Local and regional media coverage	National media coverage	International media coverage

Section 2 – Statutory Requirements

2.1 International Conventions

Australia has ratified the following international conventions relating to risk from oil and gas activities:

- International Convention for the Prevention of Pollution from Ships 1973, and modified by the Protocol 1978 (MARPOL 73/78)
- International Convention on Oil Pollution Preparedness, Response and Cooperation 1990 (IMO, 1990).

Both conventions compel the Australian Government (and in turn, State Government) to implement legislation that regulates activities in Australian territorial waters. Of relevance to VOGA, is that MARPOL 73/78 states that parties to the convention *"...shall require that operators of offshore units under its jurisdiction have Oil Pollution Plans, which are coordinated with the national system..."*

OPRC 1990, which entered into force on 13 May 1995, provides a global framework for international cooperation and mutual assistance between states and regions when preparing for and responding to major oil pollution. Contracting states are required to establish a national system for responding to oil spills, including a designated national authority, a national operational contact point, and a national contingency plan. This needs to be supported by a minimum level of response equipment, communications plans, regular training and exercises. Ships, offshore units, sea ports and oil-handling facilities are required to carry OPPs which must be coordinated with national systems for responding to oil pollution incidents.

2.2 Commonwealth, State or Territory Laws

2.2.1 Commonwealth

2.2.1.1 Offshore Petroleum Incident Coordination Framework

The Australian Government has agreed that in responding to offshore petroleum incidents originating in Australian Government waters, a central incident coordination committee be convened and chaired by the Department of Industry, Science and Resources. The committee is known as the Offshore Petroleum Incident Coordination Committee (OPICC).

The purpose of OPICC is to effectively coordinate the Australian Government efforts and resources and communicate to the public and affected stakeholders all matters relevant to a significant offshore petroleum incident that originates in Australian Government waters.

OPICC is not a mechanism to deploy Australian Government resources, exercise incident control or implement operational response arrangements. However, it can provide whole-of-government strategic collaboration to resolve conflicts and identify gaps in support of marine oil pollution emergency response activities.

2.2.1.2 Offshore Petroleum and Greenhouse Gas Storage Act 2006 (OPGGSA) and Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023

This Act provides the regulatory framework for the activity and is the principal piece of legislation relevant for this OPEP.

The OPGGS(E)R have been made under the OPGGSA and amended in 2014 with the objective of ensuring any petroleum activity is: (1) consistent with the principles of ecologically sustainable development; and (2) undertaken in accordance with an EP that has appropriate environmental performance outcomes and standards as well as measurement criteria for determining whether the outcomes and standards are met. Futher ammendments were made in 2023 and an updated Oil Pollution Risk Management Guidance Note issued by NOPSEMA in October 2024.

This OPEP meets the explicit requirements set out in the OPGGS(E)R 2023 and described in the NOPSEMA Oil Pollution Risk Management Guidance Note N-04750-GN1488 A382148 (07/10/2024).

NOPSEMA manages the regulatory approval and ongoing compliance oversight of the OPGSSA for the Facility.

2.2.1.3 Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined in the EPBC Act as matters of National Environmental Significance (NES).

Through mechanisms established under the EPBC Act, there are significant environmental sensitivities of types noted above, within the oil spill zone of potential impact for some of the credible spill scenarios from the Facility (for further details, refer to the EP). These are considered as a priority for protection should an oil spill occur.

Under the standing Notice of Exemption granted by the Minister for the Environment, persons acting in accordance with the National Plan are exempted from Part Three of the EPBC Act (requirement for approvals for activities). Once this OPEP has been accepted by NOPSEMA, this exemption includes actions undertaken that are consistent with this OPEP.

The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) manage any approvals for activities or exemptions under the EPBC Act in relation to the facility and associated activities.

2.2.2 State of Western Australia

Should oil travel inside the 3 nm limit (State waters), a range of WA legislation also affects the response operations that would be undertaken under this OPEP by VOGA. This legislation includes:

- *Pollution of Waters by Oil and Noxious Substances Act 1987*:
  - The purpose of this Act is to protect the sea and other waters from pollution by oil and noxious substances. This Act implements MARPOL 73/78 in the State and details the liabilities and penalties for discharges from ships (and other sources) and enables WA to take measures to respond to spills.

  - For the purposes of this OPEP, It provides a 'head of power' by which the WA DoT is able to undertake legal action to clean up marine pollution within State waters, and places an environmental legal obligation on the WA DoT to respond to oil spills. This has, in effect, the same legal obligation placed upon VOGA for oil spills from survey and drilling activities as per the OPGGSA and the OPGGS(E)R. In practice, it means that two parties have the same legal obligation to respond in the marine environment. VOGA proposes (and the DoT has agreed) to manage this overlapping legal responsibility through the response arrangement outlined in Section 2.3.2 of this OPEP.
  - In relation to oils spilt that have or are likely to head into State waters, the WA DoT will be notified as soon as practicable.
- *Emergency Management Act 2005* and regulations (WA):
  - The DoT is the Hazard Management Agency (*Emergency Management Act 2005*) for all Marine Oil Pollution, regardless of the source, in State waters. The MEER Unit within DoT undertakes work to prevent, prepare, respond and recover from marine oil pollution in State waters. The MEER Unit coordinates the State Response Team, personnel trained and competent at the team leader level for equipment operations, shoreline clean-up and assessment.
  - The purpose of this Act is to outline the manner in which the State of WA will implement emergency management, command, control, response and recovery arrangements during significant emergency incidents that affect the community.
- *Biodiversity Conservation Act 2016 (WA)* and Biodiversity Conservation Regulations 2018 (WA):
  - This legislation provides coverage for flora and fauna as well as important matters including habitats, communities, threatening processes and weeds. It provides protection for threatened ecological communities and strengthens protection for whales and dolphins. The responsible agency with jurisdictional authority for this Act is the Department of Biodiversity, Conservation and Attractions (DBCA).
  - The two objects of the Act are to conserve and protect biodiversity and biodiversity components in the State; and to promote the ecologically sustainable use of biodiversity components in the State.
  - For the purposes of this OPEP, this legislation clearly sets out the legislative roles of DBCA and their primacy in dealing with oiled wildlife. VOGA will manage this legislative mandate during a spill by inviting DBCA to participate in ICT activities to ensure the response is reasonable and that proportionate resources that may assist DBCA are provided.

2.3 Jurisdictional Authority and Control Agency Responsibilities

2.3.1 Jurisdictional Authority

The jurisdictional authority is the State, Territory or Commonwealth agency with jurisdictional authority for marine pollution in its area of jurisdiction. NOPSEMA is the jurisdictional authority for offshore oil and gas exploration and production activities in Commonwealth waters, while AMSA is the jurisdictional authority for vessel-based activities in Commonwealth waters.

The Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) is the jurisdictional authority for offshore oil and gas exploration and production activities in State waters, while the DoT is the jurisdictional authority for vessel-based activities in State waters and is also the Hazard Management Authority (HMA) for Marine Oil Pollution. In the event of marine pollution in State waters, the HMA (DoT) is the designated jurisdictional authority, regardless of the source.

2.3.2 Control Agency

The National Plan describes the Control Agency as the agency or company assigned by legislation, administrative arrangements or within the relevant contingency plan, to control response activities to a maritime environmental emergency. The Control Agency will have responsibility for appointing the Incident Controller (VOGA uses the term 'Incident Commander').

VOGA is the Control Agency for oil spills wholly confined to Commonwealth waters from activities in the Wandoo Field, meaning VOGA is responsible for assuming Incident Control and providing an Incident Controller (Commander). In the event that a spill has any potential to enter State waters, the WA DoT will be notified as soon as reasonably practicable. For spills arising from ships and vessels within Commonwealth waters, VOGA may undertake initial response actions and will hand over Incident Control to AMSA.

In accordance with WestPlan – MOP, the Control Agency for a Level 1 MOP emergency in State waters resulting from an offshore petroleum activity is VOGA. The Control Agency for a Level 2/3 MOP emergency in State waters resulting from an offshore petroleum activity is the DoT.

Cross-jurisdictional response activities are those activities that arise as a result of an incident originating in Commonwealth waters and requiring DoT to exercise its HMA obligations in State waters. A partnership between VOGA and DoT is required to ensure response activities across the entire incident are carried out.

Where State waters are impacted by a Level 2/3 MOP emergency resulting from an offshore petroleum activity in Commonwealth waters, DoT will only assume the role of Control Agency for that portion of the response activity that occurs within State waters.

Table 2-1: Control agency by location

Spill response/ impact location	Spill source	Control agency	Relevant OPEP
Commonwealth waters	VOGA facilities	VOGA	Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016]
	Ships and vessels	VOGA/AMSA	Exploration and Survey Operations OPEP/National Plan
State waters	VOGA facilities	VOGA	Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016]
		DoT	WA DoT OPEP
	Vessels not connected to the facility	DoT	WA DoT OPEP

Dispersant use in and around State waters must be approved by either DoT or the DEMIRS (see DoT's Dispersant Consent Use Guidance Note for further information).

2.3.3 Cross-Jurisdictional Arrangements

In all cross-jurisdictional MOP emergencies beyond Level 1, DoT will establish an Incident Management Team (IMT), and VOGA will be required to provide an appropriate number of appropriately qualified personnel for the DoT IMT. This is an initial 10 personnel in accordance with the DoT Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements (Version 4, September 2018). Figure 2-1 displays how the VOGA ICT Representatives will be integrated within the DoT IMT.

VOGA will conduct initial response actions in State waters as necessary in accordance with their OPEP and continue to manage those operations until incident control can be established by DoT.

Upon establishment of incident control by DoT, VOGA will continue to provide planning and resources in accordance with the OPEP. This will include response assets and contracts specified in their OPEP, such as those pertaining to waste management, transport and personnel as well as response arrangements with the AMOSC and other third-party responders.

In fulfilling its obligations as the Control Agency, the DoT will require VOGA to work in partnership with DoT to ensure an adequate response is provided across the entire incident. DoT and VOGA will determine the most appropriate response in State waters by working together on the IAP, protection priorities and Spill Impact Mitigation Assessment (SIMA) of response activities.

VOGA utilises an Initial SIMA Spreadsheet Tool that provides information on sensitivities at risk, and feasibility and impact of response strategies based on the spill category and season. This and the Initial IAP prepared by VOGA can be provided to DoT at the time of initial notification of a spill potentially entering state waters.

To facilitate this overarching coordination between the two Control Agencies and their respective IMTs, a Joint Strategic Coordination Committee (JSCC) will be established. The JSCC will be jointly chaired by the WA DoT State Maritime Environmental Emergency Coordinator and a VOGA nominated senior representative and comprise of individuals deemed necessary by the chairs to ensure an effective coordinated response across both jurisdictions. The control coordination arrangements for a cross-jurisdictional MEE are outlined in Figure 2-1 and Figure 2-2.

Figure 2-1: VOGA integration into DoT IMT

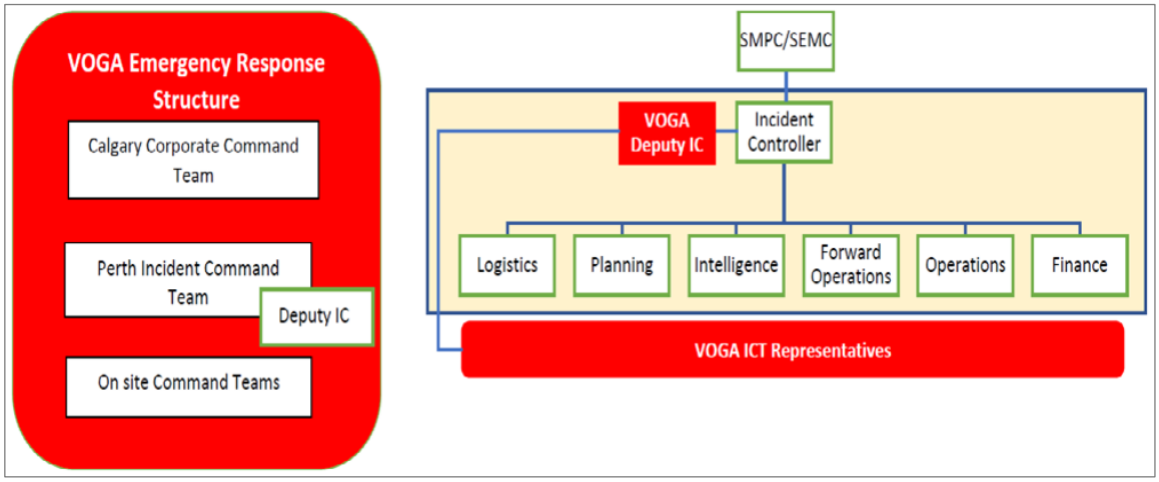
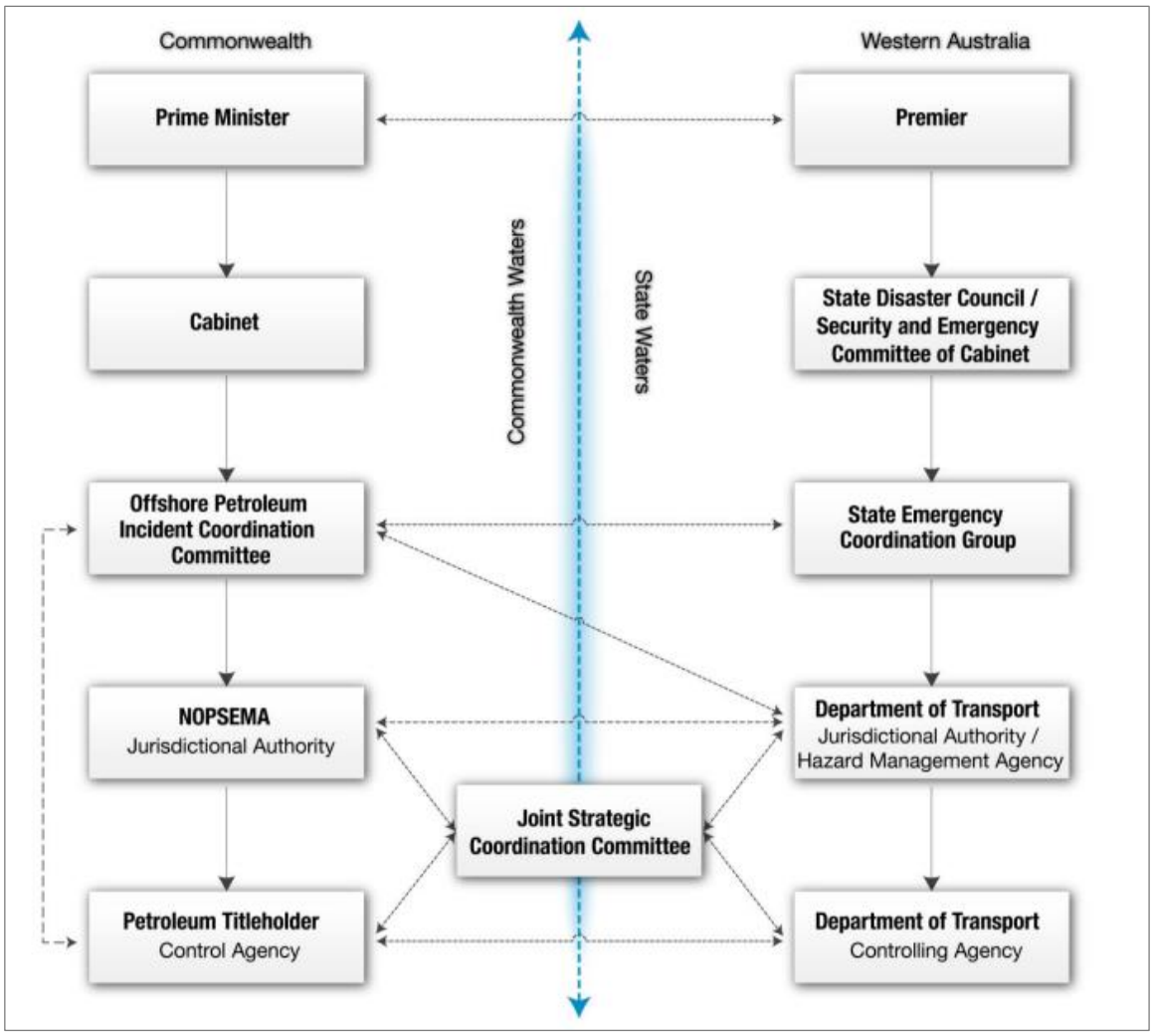


Figure 2-2: Coordination arrangements for a cross-jurisdictional MEE



2.4 Relevant Person Engagement for Planning

Relevant Person consultation during OPEP preparation was primarily focused on:

- **Legislative roles:** Ensuring that parties with a legislative role in oil spill response agree with the processes and descriptions of activities described herein, and that these response processes and procedures are consistent with the range of Commonwealth and State legislation. In particular, consultation focused on the provision of equipment and resources that can be shared between governments and industry, the 'shared' obligation to respond to oil spills within WA State waters and obligations on the WA State Government and VOGA on wildlife response.
- **Third parties:** Ensuring that other parties with an interest or role in the implementation of the plan have an opportunity to comment and agree to the processes and procedures in the plan. This includes regional oil and gas operators whose operations could be affected; or whose resources may be called upon to assist VOGA implement OSR strategies; and other parties in the Karratha area who could also assist VOGA.
- **Development of call-out contracts for key service providers:** Ensuring that commercial providers for the individual services necessary to implement the spill response strategies had the capacity and capability to do so. A number of Scopes of Work were developed and negotiated with these parties, leading to standby contracts for critical service delivery. This gives assurance that these can be called in within the required response timeframes.

Key relevant persons engaged during the development of the Wandoo Field Geotechnical and Geophysical and Exploration Drilling EPs included, but are not limited to:

- Commonwealth and State government departments and agencies
- Commonwealth and State commercial fishing
- Recreational fishers and marine users and peak representative bodies
- Traditional Custodians and First Nations nominated representative corporations
- Research institutes
- Local government and recognised local business and community reference/liaison groups or organisations
- Local environment and conservation groups or organisations
- Energy industry titleholders and operators.

The Wandoo Field Geotechnical and Geophysical Survey and Wandoo Field Exploration Drilling EPs present the responses from all relevant persons and responses by VOGA. A full copy of VOGA briefing packages, correspondence and full text of the stakeholder replies are held in the VOGA's Document Control System and provided to NOPSEMA.

During a response to a spill incident, the functions of Stakeholder Liaison Officer and Public Information Officer are responsible for ensuring all relevant persons are informed and involved where appropriate.

NOPSEMA and WA DoT are key regulatory stakeholders that are kept informed of incidents via the notification processes identified in Part 4. WA DoT in their role as HMA takes on the role of ensuring notification and situation reports are provided to the State Marine Oil Pollution Committee (SMOPC) and relevant government agencies. In this way, they act as a single point of contact.

Section 3 – Approach to Response Planning

3.1 Overview

VOGA's oil spill response planning process is based on impact and consequence scenario planning which involves establishing the context and risk; evaluating, demonstrating and defining response strategies and resources; implementation; and first response, as described in Table 3-1 and illustrated in Figure 3-1.

The process is divided into two phases: planning (refer Table 3-1) and spill response. The spill response is supported by the incident action planning process (refer Section 6); Part 5 – Oil Pollution Plans (OPPs) are initial IAPs based on existing impact assessments for the spill and response activities within the Wandoo Field Geotechnical and Geophysical Survey and Exploration Drilling EPs.

3.2 The Planning Phase

As outlined in Table 3-1, preparing for spills involves the following steps to achieve the Exploration and Survey Operations OPEP outcomes (Section 1.1):

- Step 1: Understanding the hazard profile – Outcome 1 of the Exploration and Survey Operations OPEP.
- Step 2: Identifying parameters to assess applicable response strategies and scale of the event – Outcome 2 of the Exploration and Survey Operations OPEP.
- Step 3: Identifying suitable response strategies – Outcome 2 of the Exploration and Survey Operations OPEP.
- Step 4: Understanding the impacts associated with response strategies – Outcome 2 and 3 of the Exploration and Survey Operations OPEP.
- Step 5: Ensuring capability and plan supports management of risks to ALARP – Outcome 4 and 5 of the Exploration and Survey Operations OPEP.
- Step 6: Define the environmental performance standards within the respective EPs.

The outcome of this approach is that:

- Oil spill hazards associated with VOGA's activities are addressed and risks are managed to as low as reasonable practicable (ALARP).
- Response strategies (Table 7-1) and resources are based on the nature and scale of the incident.
- Oil Spill Trajectory Modelling (OSTM) outputs for the loss of well control and vessel collision was undertaken to identify response parameters, including:
  - minimum time to impact defined environmental sensitivities
  - probability of shoreline impact to defined environmental sensitivities

  - maximum quantity of oil impact to defined environmental sensitivities
  - maximum length of oil impact to defined shoreline environmental sensitivities.

- Response strategies are risk assessed and management controls outlined in the Wandoo Field Geotechnical and Geophysical Survey and Exploration Drilling EPs are considered in this OPEP.

Table 3-1: Description of steps in oil spill response assessment (planning process)

Response planning steps
Step 1: Oil spill hazard is identified and context for each spill category and season described. This requires understanding the potential events (scenarios) which requires knowledge of: • API type, composition of reservoir/fluids assay. • Reservoir modelling of oil type or another geotechnical analysis. • Release rate, quantity, duration. • Location of activity and potential spill sources. • Metocean data matching the location and timing of activity. • Location of environmental receptors and method of impact from oil. • Toxicity of oil. • Timing of spill (season). • Thresholds. • Environment that may be affected (EMBA).
Step 2: Evaluation of response parameters is also about consideration of the hazard, as response preparation requires understanding the potential consequence, including: • Probability of oiling defined environmental sensitivities. • Minimum time to impact defined environmental sensitivities. • Quantity of oil to impact defined environmental sensitivities. • Length of shoreline impacted. • Response operating area.
Step 3: Definition of response strategies for spill categories involves designing the most appropriate response plan, such that the impacts, in the event of a spill, are reduced to ALARP. VOGA uses an assessment process for oil spill planning and response (Figure 3-1), and in doing so consider: • The oil spill hazard. • The context for each spill category and season. • Operational constraints. • Assess the impacts of the hazard and the response activities. • Assess whether impacts from the hazard and the response activities are ALARP, by considering all alternatives and their relative benefits and costs. • Where not determined to be ALARP, the response strategies are adjusted as part of an iterative process. • This iterative process considers capability and in doing so looks at the potential benefits and costs of doing more sooner.

Response planning steps
As a part of the planning the response, in **Step 4: Assess impacts of spill scenario,** VOGA also assesses the impacts of the spill response. This not only contributes to making choices about the response strategies, but also informs how the response should be undertaken to ensure that the risks and impacts of the response are managed to ALARP. This step involves: • Environmental risk and impact assessment. • OSTM of surface, entrained and subsurface oil with and without response strategies. • Identification of the controls (including environmental performance outcomes, standards and measurement criteria) to be implemented as a part of the spill.
To ensure that VOGA has a level of preparedness to implement the response strategy **Step 5: Define the response resources** is undertaken next. In this step, VOGA considers: • Operational limitations (equipment functional capacity/coverage, safety of response personnel). • Constraints of equipment effectiveness. • Scale of the spill event. • Skill-sets required for specific roles.
Step 6: Define the performance standards.

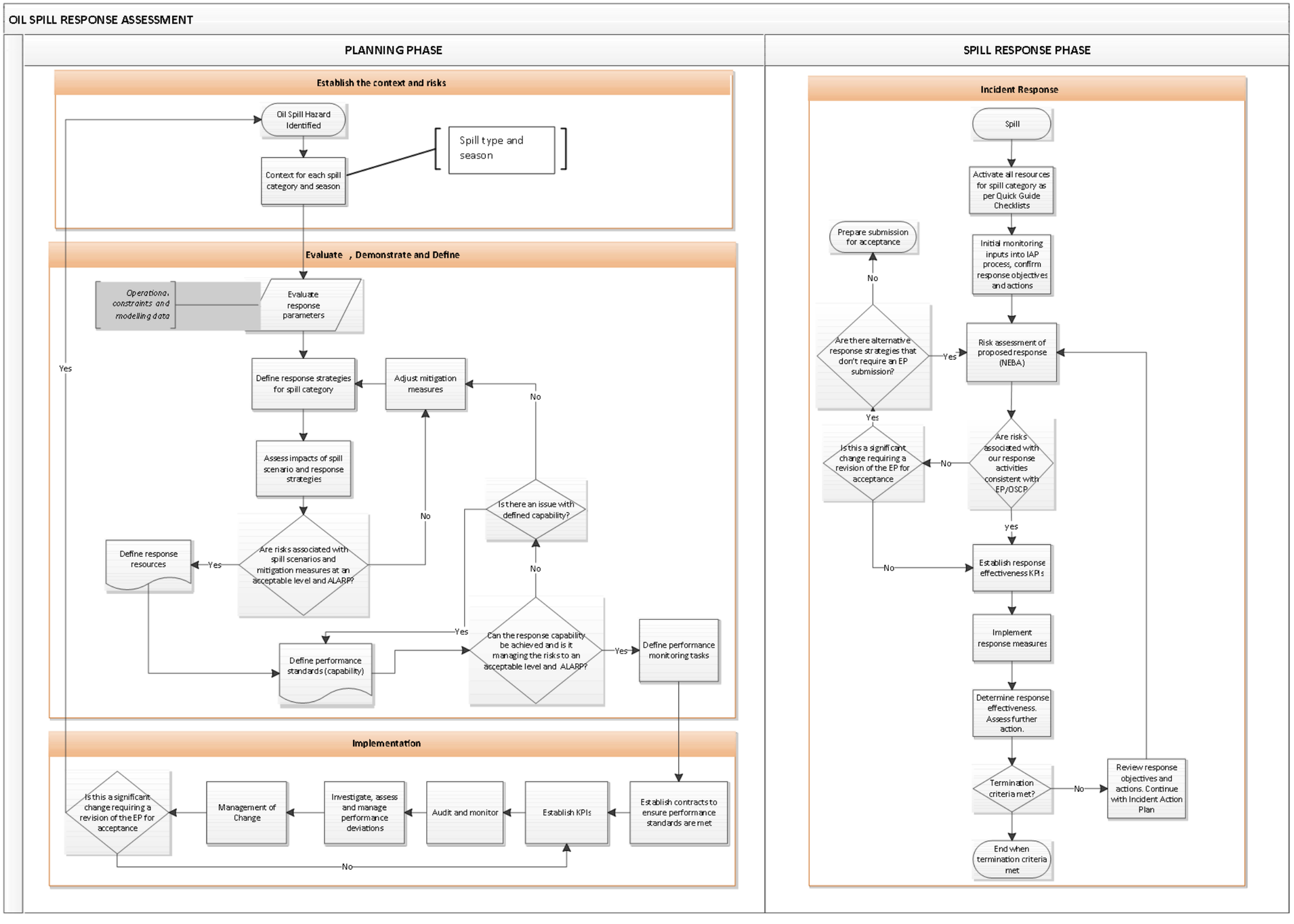
3.3 Spill Response Phase

Initial response actions are described in the Oil Pollution Plans (OPPs). These actions are based on the strategies, resources and capability identified in the planning process. Resources are activated and the outputs from monitoring and evaluation are used to conduct an impact assessment of spill impact mitigation assessment, SIMA (previously referred to as Net Environmental Benefit Assessment [NEBA]), to confirm that the risks associated with response activities are consistent within the two EPs and the Exploration and Survey Operations OPEP.If they are, then response effectiveness Key Performance Indicators (KPIs) are developed and response measures implemented. The incident action planning process provides for the opportunity to determine if response operations are effective and if termination criteria are met.

The incident action planning process used by the ICT allows for the effectiveness of each strategy to be reviewed, adjusted or halted if the objectives of the response are not being met or the environmental impacts were not addressed in the SIMA thus fulfilling Outcome 3 of the OPEP. If the impact of a response strategy is significantly higher than what is considered in the EP, then this means either impact of the strategy is unacceptable or an EP revision is required for acceptance. An example of where a revision to an EP may be required is where new technology such as that for in-situ burning or bioremediation becomes available to VOGA.

To support this approach and provide a timely response, OPPs detail an initial IAP (OPEP; Part 5) enabling response resources to be activated whilst event-specific assessments are conducted. Resources are identified and capability to achieve timeframes has been reviewed to ensure first response actions are able to be implemented.

Figure 3-1: Assessment process for oil spill planning and response



Section 4 – Establishing the Risk and Context

4.1 Oil Characterisation

4.1.1 Oil Types

Details of the oil type expected during exporation drilling (Wandoo crude) and used for vessel activities (diesel fuel oil) are presented in Table 4-1 and Table 4-2.

Table 4-1: Details of oil types

Oil type	Oil group	API gravity	Density @ 15°C	Pour point (°C)	Flash point (°C)	Viscosity @ 40°C	Predicted evaporation	Wax content	Asphalt-ene content
Diesel fuel oil	II	38.8	0.83	-36	40	1.0	High	<1%	<1%
Wandoo crude (fresh)	IV	19.5	0.9368	-24	144	~48	15%	Low	Low

Table 4-2: Boiling ranges and chemical characteristics of Wandoo crude

Characteristic	Volatiles (%)	Semi-volatiles (%)	Low volatiles (%)	Residual (%)	Density (kg/m^3)	Aromatic content (%)
Boiling point (°C)	<180	180 – 265	265 – 380	>380		
Wandoo crude	0.0	13	40.7	46.3	936.9 @ 15°C	2.87

4.1.2 Diesel Fuel Oil

Diesel is used by support vessels, plant and equipment associated with daily operations. Diesel is expected to undergo rapid evaporative loss and natural breakdown in the high energy environmental conditions experienced around the Permit Area.

4.1.3 Wandoo Crude Oil

Wandoo crude, having lost the majority of its lighter fractions due to microbial biodegradation in the reservoir, is heavier than most light crude oils typically produced on the North-West Shelf (NWS), and has a low pour point, virtually no paraffin wax, and low asphaltene content. Oils with asphaltene content less than 0.5% are less likely to form stable emulsions are more likely to disperse (ITOPF, 2014a). Laboratory data indicates that 52% of the Wandoo crude is likely to be persistent hydrocarbons (boiling point >375°C).

Weathering data for the two extreme seasonal conditions are provided in Table 4-3. The results in indicated that over half of the crude spilled on the water is likely to evaporate after 10 days of weathering in summer conditions, while 10 days of winter weathering results in over a third of the oil evaporating.

Table 4-3: Summer and winter weathering trial results, ChemCentre (2015)

Time	Summer conditions – loss (w/w%)	Winter conditions – loss (w/w%)
1 day weathered	19%	20%
2 days weathered	29%	23%
3 days weathered	36%	23%
4 days weathered	43%	28%
5 days weathered	48%	29%
10 days weathered	53%	34%
21 days weathered	55%	38%

Results of detailed testing of the efficacy of dispersants using a Mackay-Nadeau-Steelman apparatus indicate that Wandoo crude is amendable to being dispersed by five dispersants: Ardrox, Corexit 9500A, Dasic Slickgone EW, Dasic Slickgone NS, and Finasol OSR 52. The dispersant trials showed good results for all dispersants if used in the first three days, with Slickgone NA and EW both providing 100% dispersant efficacy. Refer to Table 4 in Appendix A for a comparison of dispersant efficacy results.

The spill scenarios and associated volumes identified for the survey and drilling activities are drawn from the risks identified and described in the Wandoo Field Geotechnical and Geophysical Survey and Exploration Drilling EPs.

For the purposes of oil pollution emergency planning, credible scenarios presented in Table 4-4 are based on oil spill hazards identifed in the Wandoo Field Geotechnical and Geophysical Survey and Exploration Drilling EPs, according to the following criterion:

- Type of hydrocarbon
- Instantaneous or ongoing spill
- Volume
- Amenability to similar spill response strategies.

Table 4-4: Summary of credible spill scenarios

Spill type	Possible cause	Credible upper spill volume	VOGA ERP incident level	National Plan incident level
Diesel	Vessel collision	300 m^3	Level 1	1
Wandoo crude	Loss of well control over 35 days	762 m^3/day (26,678 m^3)	Level 3	3

4.1.4 Oil Spill Trajectory Modelling

4.1.4.1 Scope

Two oil spill modelling studies and reports have been undertaken in the area of operation for the vessel and drilling activities. The two reports generated are:

- RPS (2024a) Vermilion Wandoo Exploration OSM (GOC367176)
- RPS (2024b) Vermilion Wandoo B16 OSM (MAQ08852J).

For the scenario outlined in Table 4-4, stochastic and deterministic modelling was undertaken to:

- identify sensitivities at risk from an oil spill, including sensitivities within the zone of potential contact identified by the modelling
- determine the areas over where OSR strategies may be required or implemented.

The Wandoo Exploration and B16 wells are within 7 km of each other. Both have similar credible spill volumes through Loss of Well Control modelled (26,678 m^3 for exploration activities) and (25,555 m^3 for operational well B16). Metocean, wind and regional current data used for both modelling reports are from the same dataset. Dispersant application was modelled in the B16 report with application of dispersant indicating an environmental benefit by reducing floating surface oil exposure and shoreline contact of oil across all seasons. At the end of the simulation for the deterministic trajectory that resulted in the largest volume of oil ashore and longest length of shoreline contacted above 100 g/m^2 (summer conditions), dispersant application indicated a reduction in volume of oil ashore from 5,326 m^3 (unmitigated) to 2,707 m^3 (mitigated).

Key conclusions drawn from both oil spill modelling studies are used as the basis for planning response to the loss of well control and diesel spills. Although OSTM has inherent limitations, this information has been used in the response planning phase and will be used in an actual incident to assist in the SIMA of response strategies as a basis from which to begin the IAP process.

Outputs of the Exploration OSTM are provided in the Wandoo Field Exploration Drilling EP and a summary of key findings over all seasons is presented in Table 4-5.

Table 4-5: Summary of key results for floating oil exposure and shoreline oil accumulation (RPS, 2024a)

Scenario description		Loss of well control	Vessel collision
Spill volume		26,678 m^3	300 m^3
Oil type		Wandoo crude	Diesel
Release depth		0 m (surface)	0 m (surface)
Release duration		35 days	6 hours
Simulation length		56 days	30 days
Floating oil exposure	Maximum distances from the release location to floating oil exposure thresholds	Floating oil concentrations ≥1 g/m^2 could extend up to 998 km from the release location. The maximum distances reduced to 473 km and 25 km as the threshold increases to ≥10 g/m^2 and ≥50 g/m^2 respectively.	Floating oil concentrations ≥1 g/m^2 could extend up to 31 km from the release location. The maximum distances reduced to 18 km and 6 km as the threshold increases to ≥10 g/m^2 and ≥50 g/m^2 respectively.
	Highest probablity of floating oil exposure to a receptor at or above 1 g/m^2	Mermaid Reef AMP, 97% during winter conditions.	NC.
	Quickest time before exposure to a receptor at or above 1 g/m^2	Montebello AMP, 37 hours during transitional conditions.	NC.

Scenario description		Loss of well control	Vessel collision
Shoreline oil accumulation	Probability of oil accumulation on any shoreline at or above 10 g/m^2	100% during winter conditions.	24% during winter conditions.
	Absolute minimum time for oil to accumulate on shoreline cells at or above 10 g/m^2	WA11.West (318) – Barrow Island and Montebello Islands (A), 69 hours during winter conditions.	WA11.West (318) – Barrow Island and Montebello Islands (A), 91 hours during winter conditions.
	Maximum volume of oil ashore from a single spill simulation at or above 10 g/m^2	4,550 m^3 during summer conditions.	23 m^3 during winter conditions.
	Highest probablity of oil accumulation for a specific shoreline cell at or above 10 g/m^2	WA.11 West (318) – Barrow Island and Montebello Islands (A), 92% during winter conditions.	WA11.West (318) – Barrow Island and Montebello Islands(A), 15% during winter conditions.
	Maximum volume of oil ashore from a single spill simulation for a specific shoreline cell at or above 10 g/m^2	2,570 m^2 WA11.WESt (318) Barrow Island and Montebello Islands (A), during transitional conditions.	23 m^3 WA11.West (318) – Barrow Island and Montebello Islands (A), during winter conditions.

The thickness of floating oil influences the type of response strategy implemented. For dispersant application, a thickness of 100 g/m^2 is generally used as a minimum for effectiveness. Table 4-6 summarises the maximum distance and direction from the exploration well location of three threshold levels. The thickest areas of floating oil are predicted to be within 25 km of the well location. This provides an indication as to where dispersant application should be prioritised. As the modelling is unable to allocate dispersant to the most effective zone, i.e. in terms of slick thickness and continuity, the trajectory modelling results conservatively estimate the benefit that dispersant application will have on reducing oil contact to environmental sensitivities. However, dispersant application should be a priority response activity considered in the event of a Loss of Well Control event.

Floating oil thickness also influences containment and recovery activities at sea. Containment and recovery efforts become inefficient in thinly spread oil, the area closest to the well site and of thickest coverage will be prioritised for at-sea containment and recovery. Thresholds of 1% are not practical to respond to with containment and recovery, dispersant or shoreline cleanup interventions.

In the exploration drilling modelling, oil is predicted to impact shorelines across all seasons with a high probability and short timeframe (Table 4-7). Winter is the worst season for shoreline accumulation at and above the actionable cleanup threshold of 100 g/m^2. There is a 100% probability of impact with an average shoreline length of 105 km being impacted at 100 g/m^2 and a minimum timeframe of 78 hours. The average volume of oil ashore for this season at 100 g/m^2 is 1,170 m^3 and the worst-case single spill is estimated to be 3,579 m^3.

Table 4-6: Comparison of OSTM results floating oil exposure for summer, transitional and winter seasons without dispersant application (RPS, 2024a)

Oil	Amount	Floating oil exposure threshold	Summer maximum distance (km) and direction from release location	Transitional maximum distance (km) and direction from release location	Winter maximum distance (km) and direction from release location
Marine diesel oil	300 m^3	1 g/m^2	21 km NE	31 km E	29 km S
		10 g/m^2	14 km NE	17 km NW	18 km S
		50 g/m^2	5 km W	6 km NW	3 km E
Wandoo crude	26,678 m^3	1 g/m^2	647 km NE	998 km SW	741 km NE
		10 g/m^2	55 km W	473 km W	311 km SW
		50 g/m^2	15 km E	25 km NE	13 km W

Table 4-7: Comparison OSTM results shoreline accumulation Wandoo crude without dispersant application (RPS, 2024a)

Shoreline statistics	Summer			Transitional			Winter		
	Shoreline accumulation thresholds			Shoreline accumulation thresholds			Shoreline accumulation thresholds		
	10 g/m^2	100 g/m^2	1,000 g/m^2	10 g/m^2	100 g/m^2	1,000 g/m^2	10 g/m^2	100 g/m^2	1,000 g/m^2
Probablity of contact to any shoreline (%)	93	79	56	87	75	57	100	99	82
Absolute minimum time to shore (hours)	78	93	158	85	108	167	69	78	111
Maximum accumulated volume (m^3) from a single spill simulation	4,550	4,431	3,474	3,670	3,589	3,179	3,637	3,579	2,972
Average accumulated volume (m^3) across all spill simulations	719	668	400	719	688	516	1,208	1,170	901
Maximum length of shoreline (km) from a single spill simulation	1,320	588	122	524	268	102	518	248	85
Average length of shoreline (km) across all spill simulations	248	97	17	166	65	17	224	105	30

Table 4-8: Comparison of OSTM results shoreline accumulation diesel (RPS, 2024a)

Shoreline statistics	Summer			Transitional			Winter		
	Shoreline accumulation thresholds			Shoreline accumulation thresholds			Shoreline accumulation thresholds		
	10 g/m²	100 g/m²	1,000 g/m²	10 g/m²	100 g/m²	1,000 g/m²	10 g/m²	100 g/m²	1,000 g/m²
Probablity of contact to any shoreline (%)	2	NC	NC	9	1	NC	24	6	NC
Absolute minimum time to shore (hours)	152	NC	NC	136	366	NC	91	110	NC
Maximum accumulated volume (m^3) from a single spill simulation	1.2	NC	NC	5.3	1.6	NC	23.2	20.3	NC
Average accumulated volume (m^3) across all spill simulations	<1	NC	NC	<1	<1	NC	1	<1	NC
Maximum length of shoreline (km) from a single spill simulation	5	NC	NC	19	1	NC	14	6	NC
Average length of shoreline (km) across all spill simulations	0.08	NC	NC	0.51	0.01	NC	1.55	0.23	NC

4.2 Key Sensitivities

Barrow Island, Montebello Islands and the Dampier Archipelago are identified in the OSTM as key sensitivities contacted by oil. Environmental, sociological and economic sensitivities within the Permit Area WA-14-L and the identified EMBA have been assessed. Key sensitivities within the EMBA are detailed in the EPs, which describe key marine habitats, associated flora and fauna, social and economic values, and areas of environmental significance as outlined below.

The area of coastline that could be affected contains a wide range of environmentally significant sensitivities, including:

- **Key marine habitats** (corals, seagrasses, macro-algae, subtidal soft sediment, mangroves, intertidal beaches/mudflats).
- **Key marine fauna** (birds, marine mammals, marine reptiles, sharks).
- **Social and economic** (National Heritage and Shipwrecks, fisheries and aquaculture, commercial shipping, Defence, other users, World Heritage Areas, Commonwealth Marine Protected Areas, State Marine Protected Areas).

Additional detail is available through the Oil Spill Response Atlas (OSRA) as described in OPP1 and OPP2 task guidance notes.

Determination of environmental sensitivity requires both the identification of resources present and an assessment of the consequence to the resources should they be affected by oil. The 'Hazard Assessment' within the Wandoo Field Geotechnical and Geophysical Survey and Exploration Drilling EPs detail the potential impact of hydrocarbon on key environmentally sensitive habitats and associated flora and fauna from various spill scenarios.

PART 2: Incident Management Process

Section 5 – Emergency and Crisis Management Response

5.1 Overview

Arrangements for managing emergencies are detailed in the VOGA Wandoo ERP [VOG-2000-RD-0017]. For consistency and alignment with corporate practice, the management of oil spill emergencies described in this OPEP are based on the framework and arrangements in the ERP.

5.2 Response Structure

VOGA has an emergency management response structure that is based around three levels of organisational control: tactical, operational and strategic. The premise behind these levels of control is that those parties within VOGA with the greatest expertise to manage that aspect of the emergency are empowered to do so, with operational or strategic levels stood up to provide support in terms of planning, resources and the management of extraneous issues that while important, are managed at the lower levels of control.

There are three teams within the emergency management response structure including the:

1. Corporate Command Team (CCT).
2. Incident Command Team (ICT).
3. On-site ICT.

Figure 5-1 represents the VOGA emergency management response structure and depicts the three levels of the Calgary CCT, the Perth ICT, and the On-site ICT, including the links between teams.

The goal of the three teams within the VOGA emergency management response structure is to implement reasonable and proportionate OSR strategies until such time as the OSR may be terminated.

The teams will do this by implementing a six-step incident response cycle as described in Section 6. Prudent over-caution is used by VOGA in responding to oil spills, i.e. CCTs and ICTs will be notified with a view to being stood up for oil spills, then stood down after size and scale have been assessed and verified.

5.3 Command and Control

VOGA's ICT runs an incident control system analogous to the Australasian Inter-Service Incident Management System (AIIMS) to which the National Plan is also aligned (AFESACL, 2013).

The chain of command for incident response is depicted within the VOGA emergency management response structure. Personnel appointed to these functions are selected from within VOGA or, for protracted incidents that run for weeks or months, using trained National Response Team members, AMOSC and the AMOSC Core Group, international OSR support

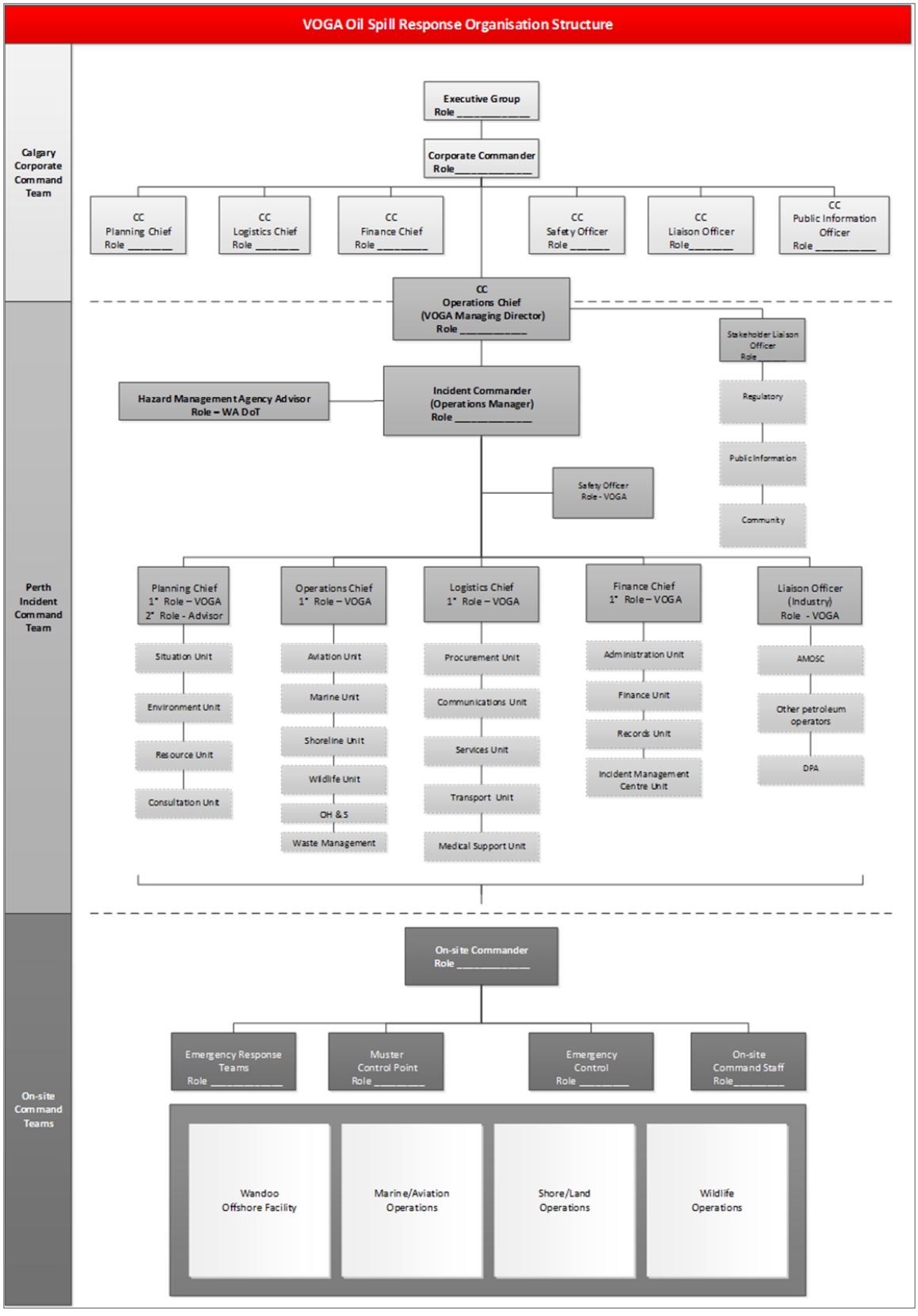
organisations, and from within the international resources of VOGA. Where required, the DoT Incident Controller has input into the team composition and structure.

Table 5-1: Key ICT functions for OSR

Role	Functional responsibilities
VOGA Incident Commander/ICT Leader	First point of contact for Person in Charge (PIC) offshore. Assists PIC to manage the response and calls out the ICT if required. Responsible for ensuring that an effective response is mounted by the On-site Command Team, and the onshore ICT. Approve IAP and where required engage State Maritime Environmental Emergency Coordinator/DoT Incident Controller for agreement/endorsement of plan for activities within, or potentially impact, WA waters.
DoT Incident Controller (Hazard Management Agency) and State Maritime Environmental Emergency Coordinator	DoT Incident Controller (Hazard Management Agency) is the State appointed incident controller for oil spill response activities within, or potentially impact, WA waters. The State Maritime Environmental Emergency Coordinator provides overall strategic management of the response and executive level support and guidance to the DoT Incident Controller.
Planning Chief Situation Resources Environment	Supervises the VOGA ICT and leads the IAP process. Records and displays data for information, planning and programming, allocation and justification. Documents and maintain records of all Wandoo Offshore Installation and VOGA ICT actions. Manages critical information requirements.
	Interfaces with State Maritime Environmental Emergency Coordinator or State Environmental and Scientific Coordinator (ESC) for input into IAP for activities impacting state waters.
	The collection, processing and organisation of operational monitoring information, e.g. OSTM, weather, sea state.
	Tracking of the deployment of resources.
	Responsible for the collection and collation of environment data/advice, e.g. obtains environmental data from OSRA and scientific monitoring (DoT ESC and local sources) with support from an Environment Unit Lead role.
Logistics Chief Procurement Services Transport Communications Medical	Develops logistics plan to support operations and provides overall resource support to emergency incident sites. Establishes and maintains lists of personnel, supplies and materials which might be required to support the emergency/disaster. Responsible for establishing any SIMOPS Plan to manage the risk generated by multiple activities.
	Acquisition of personnel and equipment.
	Acquisition of services and facilities, including waste management resources.
	Provision of air, land and sea transport services.
	Communications Sub-Plan and for ensuring the provision of communications services/support.
	Provision of medical services where needed.
Operations Chief Marine Aviation Shoreline Wildlife	Assumes responsibility for executing approved Action Plans. Responsible for all tactical command and coordination of in-country incident response assets in the assistance and support of the On-site Commander. Ensures that operational objectives and assignments identified in Action Plans are carried out effectively. Monitors operations; ensures necessary operational support is provided when and where required; allocates resources.
	Coordination and direction of all activities undertaken by waterborne craft and equipment.

Role	Functional responsibilities
Occupational Health & Safety (OH&S)	Coordination and direction of all activities undertaken utilising aircraft, e.g. aerial dispersant spraying, aerial surveillance and transport.
Waste management	Planning and coordination of shoreline assessment and cleanup activities (in consultation with the DoT, planning, specifically the environmental specialists). Implementation of shoreline cleanup activities.
	Implementation of the WA Oiled Wildlife Plan, i.e. the collection, treatment and rehabilitation of oiled wildlife in consultation with DBCA via the DoT ESC.
	Development and implementation of the OH&S Plan.
	Coordination of the containment, storage, transport and disposal of recovered oil and oily waste. Also, instruction in on-site handling, storage and/or separation and treatment.
Finance Chief	Provides monetary, insurance, legal, risk and human resources, related administrative functions to support emergency operations and to preserve vital records documenting work performed and associated costs in the event of disaster or major emergency.
Safety Officer	Assesses unsafe situations and develops measures for assuring personnel safety. Confirms safety regulatory authorities and applicable departments have been notified. Ensures implementation of safety measures and monitoring and recording of personnel exposures to hazardous products. Supports accident investigations, recommends corrective action, and prepares accident report.
CCT	Focus of the CCT is on ensuring ICT are responding in accordance with corporate requirements, liability/insurance, business continuity, media/investor relations, and financial management/support of response.
Corporate Command Operations Chief	Provides the interface between the ICT and CCT. Provides updates to the CCT regarding IAPs and communicates any needs for support if required. Responsible for ensuring VOGA's corporate objectives are communicated to the ICT and are also reflected in the IAP.
Stakeholder Liaison Officer	Responsible for managing regulatory engagement and coordinating any regulatory approvals required to implement response strategies. Coordinates engagement of stakeholders who are impacted from the spill or response activities. Coordinates investigation of reportable events. Acts as the functional interface between these various parties. Implements VOGA Communications Plan, providing media information support and serving as the dissemination point for all VOGA media releases.
Liaison Officer (Industry)	Identifies the assisting and cooperating companies and agencies, including communications link and location; provides list to the CCT. Functions as "point of contact" for assisting and cooperating agency representatives. Responsible for ensuring that parties who have agreed to undertake specific functions under the OPEP are undertaking the functions consistent with the OSR strategies, performance standards and objectives of the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-YH-0016].

Figure 5-1: VOGA OSR organisastion structure



5.4 Response Facilities

VOGA's ICT utilise VOGA's Perth office as the primary Incident Command Centre (ICC) for OSR monitoring or incident management activities.

This facility contains information communication technology infrastructure to communicate effectively with the range of parties required in a significant response, private and nearby breakout areas, along with sufficient access controls and logistical support for the ICT to operate over a number of weeks or months. In the event a unified command ICT is established with the DoT, a co-located ICC will be established at mutually agreed location.

VOGA also has access to an alternate ICC should a business continuity event, civil unrest, security or capacity issue impede VOGA's capability to fully exercise incident control from the primary facility.

For spills requiring significant field logistical support, a forward operating command area will be located as close as possible to the spill site, most likely within the Port of Dampier (Pilbara Ports Authority), with this team operating from the Port of Dampier administration building, MoF Road Dampier and the port area.

In addition, depending on spill size a forward operating post may be established. The most likely location will be at the supply base near the Port of Dampier.

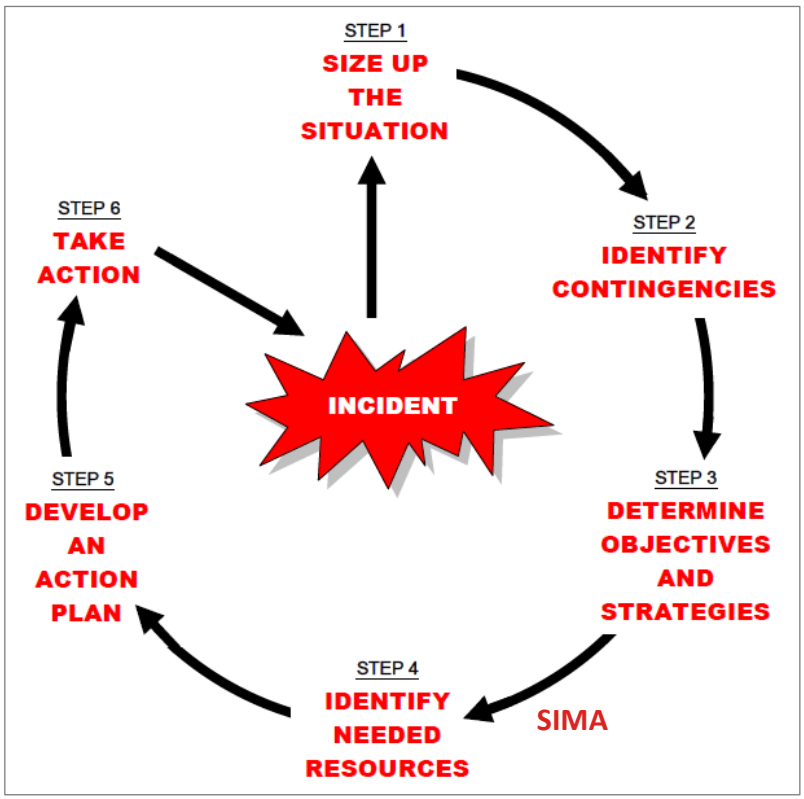
An airbase (with manager) will be established at the airport to manage the aerial operations, specifically application of dispersant. Aircraft deployed for aerial surveillance will be managed by the contract holder.

Section 6 – Incident Response Cycle

6.1 Overview

The successful management of an incident relies on the completion of a number of coordinated activities. The VOGA Emergency Response framework for incident management is based on conducting operations within a six-step incident response cycle (Figure 6-1). Initial objectives (tasks to be done), IAP and priorities will be determined through the incident response cycle.

Figure 6-1: VOGA ERP six-step incident response cycle



6.2 Size-up the Situation

The first step of the process is about gathering intelligence and gaining an appreciation of the situation. Using this information, outcomes are predicted and plans put in place to respond to the event. Information collected during this stage includes:

- Up-to-date situational awareness, some of which is collected through the tasks associated with monitoring and evaluation and includes:
  - the oil type, volume, location
  - where it is going (modelling and weather conditions)
  - when will it get there (modelling and weather conditions)
  - what environmental sensitivities are at risk (priorities for protection)

  - what is happening to it (weathering etc.)
  - what is the worst-case credible scenario.
- The adjustments required to the current incident objectives and/or response strategies.
- SIMA for proposed response strategies.

6.3 Identify Contingencies

Predictions of what the situation will be at stages during the incident, and at the final stage, will influence the activities of Operations and Logistics. It is critical that the Planning Chief can explain the basis of the predictions, the probabilities of the outcomes, and the consequences of events unfolding in a different manner.

The Logistics Chief must interpret the predictions and determine the likely future demands on the Logistics Team. This will take place in the ICT meetings, but details are likely to be resolved only through interaction between individuals in the Planning and Logistics teams.

The Incident Commander will use predictions to set priorities, perhaps between competing operational areas, and will advise senior personnel on appropriate control actions.

6.4 Determine Objectives and Strategies

Objectives are statements of the desired outcome or goal for the incident. VOGA's objectives for initial spill response activities as described in the OPPs are to:

- Ascertain extent of spill
- Prevent impact to sensitive resources.

A strategy defines what is going to be done – a broad plan, developed in support of the incident objectives, that is used to combat the incident. Strategies follow on from the objectives and are achieved through successful implementation of tactical plans. For ongoing incidents, strategies are regularly reviewed and new ones developed when necessary, particularly if the control objective is amended.

Strategies for spill scenarios in this OPEP have been identified and risk assessed according to net environmental benefit; and prepared for in terms of resources required to implement the strategy. The SIMA is used to identify and compare the potential effectiveness and impacts of response options, enabling a qualitative determination of the most appropriate response strategy. This process should guide the decision on which strategy is most appropriate to the particular spill each time the plan is reviewed.

6.5 Spill Impact Mitigation Assessment

SIMA is a tool that has been developed to help facilitate the selection of the most appropriate response options to effectively combat an oil spill, it replaces the NEBA process previously used across industry. VOGA has adopted the use of this tool in a strategic sense in this OPEP to select response options and will use the tool in an operational sense in the response planning cycle during by the Planning Chief or Environment Unit Team Leader within the Planning Team.

Like the NEBA, SIMA takes into account the advantages, limitations and added risks associated with individual OSR techniques and strategies, however, it has a broader perspective than environmental considerations and incorporates ecological, socio-economic and cultural aspects. It is a process that provides a means to balancing the trade-offs and selecting the best response option(s). The four stages of a SIMA are set out in Table 6-1.

Table 6-1: Four stages of a SIMA

Stage	Description
1	Compile and evaluate the data for relevant oil spill scenarios including fate and trajectory modelling, identification of resources at risk and determination of feasible response options.
2	Predict outcomes/impacts for the 'no intervention' (or natural attenuation) option as well as the effectiveness (i.e. relative mitigation potential) of the feasibile response options for each scenario.
3	Balance trade-offs by weighing and comparing the range of benefits and drawbacks associated with each feasible response option, including no intervention, for each scenario.
4	Select the best response option(s) to form the strategy for each scenario based on the combination of techniques that will minimise the overall ecological, socio-economic and cultural impacts and promote rapid recovery.

Information requirements for the SIMA process:

- A copy of the OPP for the spill category – refer to Sections 10.2 and 11.2
- Current situation report (SITREP form) that includes details about the spill, weather, currents and tides, action taken to date, forecast situation
- OSTM outputs from the OPEP; and/or forecast OSTM outputs utilising real-time spill and metocean conditions
- Preferred response option/s from Section 7
- Priority protection areas/resources identified in the OPP
- Sensitive receptors at risk from oiling
- Outputs from monitoring and evaluation operations (e.g. aerial surveillance)
- Knowledge of response strategy impacts, advantages, constraints and limitations.

Once oil type, quantity, real-time weather information, and a trajectory pathway are known, the sensitivities within the EMBA need to be identified. The Planning Chief will review the protection priority ranking that has been provided in the OPPs and consider outputs from OSTM analysis, including:

- The probability of impact – will the response strategy reduce the probability of impact of to the sensitive receptor?
- Minimum time to impact (days) – will the response strategy increase the number of days before impact to the sensitive receptor?
- Severity of impact (quantity of oil) – will the response strategy reduce the average and/or total amount of oil to impact the sensitive receptor?
- Impacts associated with the proposed response strategy – will the response operation have more of a negative impact than untreated oil?

- What controls will be put in place to mitigate impacts associated with the proposed response strategy?
- The recovery time of the receptor after exposure to hydrocarbons – is recovery time likely to be short or long term?

A decision must be made as to which sensitive receptors have the highest protection and/or cleanup priority and which response strategy/strategies will minimise the overall ecological, socio-economic and cultural impacts and promote rapid recovery. The VOGA SIMA template (Appendix E) provides guidance as to the prioritisation of receptors. If there are conflicting outcomes for a particular response option, then the receptor with the higher priority becomes the preferred response option.

In the initial phase of a spill, VOGA has prepared an assessment tool to complement the OPPs and assist in identifying sensitive receptors, assessing environmental benefits and impact of response strategies in line with the Survey and Exploration EPs.

VOGA's spill response planning process (Figure 3-1) then requires that the response strategy decision needs to be reviewed to ensure that the risks and impacts associated with the response options are consistent with those identified in the EP. If the risks and impacts are not consistent with those identified in the EP, then the following will occur (as per Figure 3-1):

- Response strategy controls are identified and assessed,
- An alternative response strategy is assessed, or
- An application for approval to implement the response strategy will be made.

During the final stages of an OSR, cleanup activities will take into account five broad questions as suggested in IPIECA (2015):

- Is the remaining oil a potential source of harm to environmentally sensitive receptors?
- Would further cleaning do more harm than good?
- Does the oil interfere with the aesthetic appeal or recreational use of the shoreline?
- Does the residual level of contamination adversely affect economic resources or disrupt economic activities?
- Does the effort involved in further cleaning outweigh environmental or economic benefits that could be achieved?

The SIMA will be completed on the following timeline:

- Within 24 hours of the spill as part of the OPP
- Every 24 hours as part of the IAP cycle
- As required if the situation changes beyond what is planned for and response strategies require evaluation
- Until termination criteria are met for response strategies and ultimately the incident.

6.6 Identify Required Resources

Resources required to implement response strategies have been identified in OPP 1, OPP 2 and the Logistics Management Plan [VOG-7000-RH-0008]. Contracts have been established to support the activation/deployment of these resources within the timeframes identified. The Logistics Chief maintains a record of contracts in place to provide spill response resources and will activate these as required. The contracts agreement and rates that provide minimum resources are reviewed annually to ensure currency.

Current resource allocations and availability is provided through liaison with the Logistics Chief and includes information such as:

- Service providers currently engaged by VOGA being redirected to OSR activities
- Activation of specific OSR/emergency response contracts
- Identification of resources of opportunity.

The ability to meet the resource demand during a spill has been assessed in the OSR Capability Review [VOG-7000-RH-0009].

6.7 Develop an Incident Action Plan

A tactical plan describes how a job will be done – the deployment of resources at an incident to execute all or part of a strategy. Tactics are implemented by team leaders who are responsible for the deployment of resources at an incident or in an incident division or sector. Tactics specify jobs that must be completed within stated parameters (time, size, equipment to be used, standards etc.) in order for the strategy to be carried through.

Tactical plans will include the controls that should be used to ensure the impacts associated with response activities are reduced to ALARP.

Once tactics are in place, the actual work can be allocated to those who will perform it. This is called 'tasking'. Tasks are the smallest components of the IAP and are generated by team leaders for specific jobs that are required. The achievement of any objective is through the completion of many individual tasks.

6.7.1 Briefings

Briefings are used to communicate the IAP to responders and ICT support personnel. A briefing (verbal and written) should take the form of Situation, Mission, Execution, Administration and Logistics, Command, Control and Communication, and Safety (SMEACS):

- **S**ituation – what has happened, response effort so far
- **M**ission – the overall aim of the response
- **E**xecution – who, how and what will be done in the response
- **A**dministration and logistics – arrangements to support the ICT and responders
- **C**ommand, control and communication – who to report to, who has responsibility for the incident, and how responders and the ICT communicate

- **S**afety – hazards and controls.

6.8 Take Action

The operational phase involves implementing the strategies and executing the tasks identified in the IAP. Throughout this phase, situational awareness should be regularly updated and include a briefing of the IAP.

The Planning Chief goes through a cycle of preparing for meetings, conducting meetings, preparation and modification of the IAP, and addressing issues emanating from the meetings. Information provided to the Logistics Team is to support that team in their work and the development of their components of the IAP.

This cycle may repeat a number of times during the shift. Towards the end of the shift, however, the process changes in that the focus of the IAP becomes one for the incoming shift rather than for the existing incident staff. The planning cycle repeats with extra components such as briefings and handovers. At the end of the shift, the incoming Planning Chief repeats the process.

To assist in the maintenance of situational awareness, the Operations Chief should also be collating information from the response teams to allow the assessment of the effectiveness of the response strategies. This feedback assists in determining effectiveness of response strategies.

Logistics ensures the implementation of response strategies by operations can be achieved through the provision of personnel and equipment.

6.9 Review Phase

Incident parameters evolve and as such, action plans must be revised on a regular basis (at least once per operational period) to maintain consistent, up-to-date guidance across the system. The purpose of the review phase is to ensure that:

- Incident objectives are reviewed to address change in circumstances
- Response strategies are achieving the incident objective
- Performance measures identified are being met
- Resources are effectively allocated.

The review phase involves assessing the effectiveness of the strategies identified in the IAP to assess whether there are any improvements required to the incident strategies. This is done by:

- Considering the information provided via feedback from the Operations Team on the situational awareness
- Reviewing the environmental priorities
- Assessing whether the incident objectives are being met, and if changes are required to address potential changes in the above items.

The Planning Team must also be able to analyse the performance of the response effort as a whole. This should be done during the incident to ensure that the objectives, strategies, tactics are working, and to find out the causes where they are not. To achieve this, each response strategy must have a section on measuring effectiveness.

Particular effort should be made to debrief personnel as they come off shift. Mechanisms to capture information from the field must be put in place prior to the shift change, and personnel made aware of the expectation put on them. Debriefs should not be overly formal and should not delay for avoidably long periods those going off duty to rest. Information gathered at debriefs is recorded and distributed to those who may be affected by it. The Planning Chief is responsible for coordinating this work and providing the assessment and proposed changes to the Incident Commander.

6.10 Adjust Phase

The adjustment phase involves determining the new or revised incident objectives and strategies for the next IAP and assessing if progress towards termination criteria is being made. The Incident Commander's decision making is based on understanding:

- Situational awareness and the potential worst-case credible scenario
- The available response strategies, their benefits and operating limitations
- The environmental priorities utilising
- SIMA to guide the decision-making process (as advised by the Planning Chief in the ICT).

There will be occasions where the resources available to the Incident Commander and the ICT as a whole are not sufficient to carry out all preferred response options. It is the responsibility of the Incident Commander to make the decision about which strategies and tactics receive the resources; they need to prioritise the response to ensure the maximum benefit of the response effort. Managing competing demands for resources and also protection priorities is a key part of the role of Incident Commander, and to do this effectively they require a high level of situational awareness which is obtained from the activities within the Planning Team. The Liaison Officer (Regulatory) needs to be engaged on the proposed changes to ensure the appropriate regulatory approvals are obtained as necessary prior to implementation.

Section 7 – Response Strategies

7.1 Overview

Response strategies which may be appropriate for each spill category have been identified using the systematic approach to planning and the anticipated net environmental benefit of each using a SIMA. These response options are described in Sections 7.2 to 7.8 and are summarised in Table 7-1. An outcome of this process is the creation of two OPPs to assist the ICT and on-site responders in the initial response to an oil spill as a precursor to a formal IAP.

The ongoing response in an incident (IAP) will use the latest available spill information and the following to decide on the most appropriate ongoing response strategies:

- Potential impact of spill and the response strategy
- Operational constraints of the day – primarily safety, sea state and weather, but can also include logistical factors
- First response activities undertaken to combat the incident such as those undertaken in the OPP 1 and OPP 2 (Part 5).

It is important to note that the description of these strategies and application to each scenario does not mean that they will definitely be implemented during a response. They are not certain to occur except for monitoring and evaluation, which applies to all spill incidents.

Table 7-1: Summary of likely response options and environmental impact considerations for each spill scenario

Response consideration	Marine diesel spill	Loss of well control
Upper credible scenario	Single release 300 m^3.	Continuous release over 35 days 26,678 m^3.
Predicted outcomes based on Exploration OSM Report (GOC367176)	Is expected to evaporate rapidly with a low probability of shoreline impact, under 10% except for in winter where there is an estimated probability of 24% for shoreline accumulation at or above 10 g/m^2. The earliest shoreline impact is at 91 hours and the greatest volume ashore is 23 m^3.	Modelling suggests 100% contact to shorelines in winter at 10 g/m^2 threshold 93% in wummer and 87% in Transitional season. The earliest shoreline impact is at 69 hours.
Source control		
Identified as suitable?	Yes.	Yes.
SIMA considerations	Source control activities include, shutting off pumps and transferring fuel to another fuel tank. All strategies would be effective in minimising the amount of hydrocarbons lost to the environment and would reduce the area of potential exposure.	Regaining control of a well may require a relief well to achieve the desired result.

Response consideration	Marine diesel spill	Loss of well control
Monitor and evaluate		
Identified as suitable?	Yes.	Yes.
SIMA considerations	All spills will be monitored and evaluated to assess the natural biodegradation of the hydrocarbons and ensure situational awareness of the spill is maintained by VOGA emergency response teams.	All spills will be monitored and evaluated to assess the natural biodegradation of the hydrocarbons and ensure situational awareness of the spill is maintained by VOGA emergency response teams.
Chemical dispersion		
Identified as suitable?	No.	Yes.
SIMA considerations	Marine diesel is not a persistent hydrocarbon; it has a high natural dispersion and evaporation rate due to the high percentage of volatile components within the oil. A small increase in sea state (wave and wind action) can assist natural biodegradation through entraining diesel in the water column. Shoreline impact is not anticipated.	Dispersants will be assessed as a response option to increase the rate of biodegradation and minimise and the impacts of oil on the environmental sensitivities in the EMBA. Dispersant use could potentially result in an increase in environmental benefit for mangroves, mudflats, marshland, sandy beaches and rocky shores; as well as turtle nesting sites, migratory birds, seabirds and shorebirds. A dispersant test spray run will be undertaken prior to moving to full dispersant application operations to verify its effectiveness. Dispersant application was modelled in the B16 OSM Report. For all seasonal conditions assessed, the modelling demonstrated a reduction in the length of shoreline contact (above 10 g/m^2), when the surface dispersant was applied. For the unmitigated case, the greatest length of shoreline contact at, or above, the low threshold (10 g/m^2) during the summer, transitional and winter seasons was 898 km, 227 km and 233 km, respectively, compared to 691 km, 160 km, 190 km for the mitigated case, or a reduction of 30%, 42% and 22%, respectively. The greatest volume of oil on shore from a single spill trajectory was predicted to reduce from 5,606 m^3, to 2,737 m^3 when the mitigation option was considered. This represented a reduction of 45%.

Response consideration	Marine diesel spill	Loss of well control
Mechanical dispersion		
Identified as suitable?	No.	Yes.
SIMA considerations	Diesel spreads and evaporates rapidly. Mechanical dispersion may inhibit the rate of evaporation and could cause the oil to emulsify.	Mechanical dispersion will be assessed as a response option to enhance dispersion and dilution of oil into the water column which then leads to biodegradation of the oil. Mechanical dispersion can result in an increase in environmental benefit for all ecological sensitivities and for mangroves, marshlands, mudflats, sandy beaches, rocky shores and open waters.
Containment and recovery		
Identified as suitable?	No.	Yes.
SIMA considerations	An instantaneous spill of diesel will spread and evaporate rapidly due to the high proportion of volatile components within the oil and will not be of a sufficient thickness to provide for effective containment and recovery operations.	Containment and recovery can be used to recover oil to prevent it impacting on environmental, social and cultural sensitivities. Containment and recovery may be effective on Wandoo Crude as it is a persistent crude oil with a high specific gravity and viscosity. Depending on metocean conditions, containment and recovery is expected to have a removal rate of 10% to 15% (ITOPF, 2014b). Containment and recovery will be used if metocean conditions are suitable and if oil is of suitable thickness.
Protection and deflection		
Identified as suitable?	No.	Yes.
SIMA considerations	Diesel spreads and evaporates rapidly; it is unlikely that a spill in this category will be of a sufficient thickness to be effectively corralled or deflected by booms. OSTM for this scenario show that there is a probability sensitive marine resources will be impacted by oil at a thickness greater than 10 g/m^2, hence protection and deflection may result in an environmental benefit for turtle nesting sites, migratory birds, shorebirds, mangroves, marshland, mudflats, sandy beaches and rocky shores.	Where the EMBA indicates impact to shoreline sensitivities, protection and deflection will be assessed as a response strategy. OSTM for this scenario show that there is a probability sensitive marine resources will be impacted by oil at a thickness greater than 10 g/m^2, hence protection and deflection may result in an environmental benefit for turtle nesting sites, migratory birds, shorebirds, mangroves, marshland, mudflats, sandy beaches and rocky shores.

Response consideration	Marine diesel spill	Loss of well control
Shoreline cleanup		
Identified as suitable?	No.	Yes.
SIMA considerations	OSTM suggests the maximum volume of oil ashore from a single spill simulation is 23 m^3, however, the average across all spill scenarios is 1 m^3. Shoreline cleanup activities have the potential to cause more harm than good and as such require careful planning and execution. An increase in environmental benefit can generally be achieved when cleanup activities are undertaken on sandy beaches and areas where there are turtle nesting sites, migratory birds and shorebirds.	Shoreline cleanup activities will be assessed as a response where impact is predicted to occur in areas of highest sensitivity. The exploration drilling OSTM suggests a minimum time to shore of approximately 78 hours for a accumulation threshold of 100 g/m^2 (the actionable cleanup threshold). Dispersant application modelled in the B16 well OSTM suggests a reduction of shoreline accumulation of approximately 45%. Shoreline cleanup activities have the potential to cause more harm than good and as such require careful planning and execution. An increase in environmental benefit can generally be achieved when cleanup activities are undertaken on sandy beaches and areas where there are turtle nesting sites, migratory birds and shorebirds.
Oiled wildlife response		
Identified as suitable?	Yes.	Yes.
SIMA considerations	Surveillance for oiled wildlife will be conducted as per the VOGA Operational and Scientific OSM BIP. Oiled Wildlife Response (OWR) will be undertaken for all categories if required.	
In-situ burning		
Identified as suitable?	No.	No.
SIMA considerations	Diesel evaporates rapidly and is not suitable for in-situ burning.	Wandoo crude is not amenable to in-situ burning (flash point of 144°C), and the required equipment, technology, approved accelerant, and training is not readily available in Australia.

7.2 Source Control

Where practical and safe to do so, the emergency response plans to isolate and control the source of spills are implemented as a parallel activity alongside response activities. The aim of source control is to control or stop the flow of oil so that the amount of oil escaping in the environment is minimised. Control of the spill source is considered to be a primary spill response and only undertaken when safe to do so.

Source control actions for all spill categories will be instructed by the responsible PIC of either the vessel, MODU or facility where the incident occurs. Control actions will be undertaken in

compliance with the spill response plans listed in Section 1.5 and will be appropriate to size of the spill. Source control activities proposed for each spill category is summarised in Table 7-2.

Table 7-2: Source control options

Spill category	Spill type	Credible upper spill volume	Product type	Source control activities
A	Vessel collision	300 m^3	Marine diesel oil	Contain diesel onboard or transfer fuel to another tank if possible. Isolating affected tank or tank lightening. Vessel separation.
B	Loss of well control	26,678 m^3	Wandoo crude	Close Blowout Preventer (BOP), drill relief well as per Source Control Contingency Plan.

7.2.1 Loss of Well Control

A Source Control Contingency Plan details options available to regain control of a well after a well blowout. It provides campaign-specific details relating to reservoir conditions, blowout taskforce team structure, and logistics. The objective of the document is to have as much planning as possible conducted upfront to minimise the response time of remedial measures. The Source Control Contingency Plan is managed by the VOGA Well Construction Manager.

Real-time phases associated with responding to an uncontrolled hydrocarbon release include:

- Phase 1: Initial response, convene well construction ICT and gather information
- Phase 2: Determine most efficient well kill method
- Phase 3: Detailed planning of the well kill operation
- Phase 4: Execute well kill operation
- Phase 5: Cleanup operation
- Phase 6: Incident investigation.

If a loss of well control cannot be controlled via secondary well control procedures (e.g. closing a BOP), well fluids may continue to be released until a relief well is drilled or the well is capped and the flow intersected.

VOGA will mobilise an appropriate Mobile Offshore Drilling Unit (MODU) from local or international sources that has the required specifications to drill a relief well and regain control over the well that is blowing out. Plans for drilling a relief well will begin in parallel to progressing other well intervention options (to stop the flow of hydrocarbon or to permanently secure the primary well) (Phase 1).

The relief well will intersect the uncontrolled zones from the primary well and specialised plugging fluids will be pumped into the well to overcome the reservoir pressure. Well kill modelling will be conducted to confirm the fluid rates, pump rates and volumes that will be required to maintain integrity of the primary bore.

VOGA has a contract in place with Wild Well Control who will assist in providing these engineered solutions to regain control after a well blowout.

The process associated with planning and drilling of a relief well, if required, is estimated to take 78 days. Table 7-3 estimates the timing for each high level phase.

Table 7-3: Relief well schedule

Task activities	Duration (in days)
Event reported – begin mobilisation of rig for relief well drilling	1
The following three tasks being completed simultaneously: • Well design and engineering completed – 30 days • Relief well rig onsite (via NWS or SE Asia) – 35 days • Regulatory submissions and approvals – 50 days.	50
Spud and drill relief well to intersect wellbore and bottom kill well to control source	27
Total duration	**78 days**

7.3 Monitor and Evaluate

7.3.1 Description of Monitor and Evaluate Response Strategy

All spills will be monitored and evaluated to assess the natural biodegradation of the hydrocarbons and ensure situational awareness of the spill is maintained by VOGA emergency response teams.

Monitor and evaluate is a response strategy that can take on two functions:

- To monitor natural recovery (no intervention with physical or chemical response strategies)
- Monitoring which involves maintaining situational awareness and an assessment of response effectiveness.

Specific items to be monitored are; trajectory of spill, oil characteristics, extent of slick, resources that may be impacted, and effectiveness of other response strategies.

The ongoing monitoring and evaluation of the oil spill is a key strategy that allows managers of the response to maintain situational awareness, an up-to-date understanding of the success of other response options, and to monitor the natural weathering of the oil. It is by ongoing monitoring and evaluation of the situation that the response may be tailored day-to-day, adjusting and pre-empting the consequences of the oil spill and mitigating the worst of these consequences.

Monitoring and evaluation is undertaken in order to obtain information which will assist in the planning and execution of oil spill response strategies. The nature of the monitoring program implemented will depend on the needs of the incident, and may involve:

- Aerial surveillance
- Remote (satellite) sensing
- Satellite tracking buoys

- Oil spill trajectory modelling
- Oil sampling
- Shoreline assessment
- Oiled fauna surveys
- Water quality sampling
- Sediment sampling.

Operational monitoring provides data in a usable timeframe to provide the ICT with an appreciation of the situation. Scientific monitoring is undertaken in order to obtain information which will provide indicative or quantitative data for short-term and longer-term environmental effects assessment. This OPEP refers to the OSM BIP [WAN-2000-0001.04] for oil spill monitoring services.

7.3.1.1 Shoreline Assessment

The precursor to shoreline clean-up activities is the Shoreline Cleanup Assessment Technique (SCAT) surveys. The role of SCAT teams is to systematically survey the area affected by the spill to provide rapid accurate geo-referenced documentation of shoreline oiling conditions. A SCAT program includes field assessment surveys, data management and data application components as part of the spill management organisation. Specific and standard terminology is used to describe and define shoreline oiling conditions and is recorded on a pro-forma. SCAT surveys provide a geographic or spatial description and documentation of the shoreline or oiling conditions.

Frequently, SCAT teams are asked to provide recommendations regarding appropriate cleanup methods and to define constraints or limitations on the application of cleanup techniques, so that the treatment operations do not result in additional damage to the shoreline.

The number of SCAT teams required depends on the size of the affected area and complexity of the habitats to be surveyed. The required turnaround time for the information can also influence the number of SCAT teams deployed. For example, if the shoreline response/coordination centre requires data for an area to prepare the assignments for the next day, then all available teams may be deployed to that location. The UK SCAT Manual (2004) suggests that for a small-scale operation, where a spill that affects less than 50 km of coast, it could be surveyed in one to two days with one or two teams.

A spill in a larger area or one that would require a longer coastal survey probably would involve more field teams and office-based data management support. It is important to remember that some sections of shoreline may need to be resurveyed if oiling conditions change on a daily basis.

Shoreline waste generation can be reduced by identifying shorelines likely to be impacted and pre-cleaning the shore of debris and vegetation before oil strands, thus reducing the total amount of oily waste to dispose of. Shoreline waste generation can range from 3 to over 10 times the amount of oil stranded. In-situ cleanup techniques are ideal for minimising the generation of waste and are particularly suited to remote area response where the logistical requirement associated with waste management and transfer can be a limiting factor. The

Guidelines and Strategies for Oil Spill Waste Management in Arctic Regions (Polaris, 2009) reported that *"the key factor in waste generation is neither the amount of oil spilled nor the amount of shoreline that is oiled. The volume of waste generated during a response operation is a function of the nature of the spill (type and volume of oil, natural weathering processes) and location and length of oiled shoreline, combined with the decisions made by spill managers who select the treatment and clean-up methods and the level of effort (treatment end points)."*

This information, although from a different geographical region, is considered relevant to shoreline response teams working in remote locations in northwest WA because of the same logistical constraints posed by working in remote locations. Consideration will be made in the VOGA IAP process to ensure that response techniques and waste management are aligned so that the overall generation of waste is minimised.

OSRL provides shoreline assessment teams via the OSM Supplementary Service through Operational Monitoring Plan 6.

7.3.2 Operational Constraints for Monitor and Evaluate

Operational constraints for monitoring and evaluation include, but are not limited to:

- Remote location of vessel and drilling activities and potentially affected surrounding areas
- Ability for aircraft to undertaken aerial surveillance (limitations relating to suitable aircraft being available, night-time operations, distance from mainland)
- Availability of trained aerial observers
- Communication of data collected back to the ICT and clarity around units in which information is recorded (e.g. nm/km; datum in which coordinates have been recorded etc.)
- Verification of information being collected.

7.4 Chemical Dispersant

7.4.1 Description of Chemical Dispersant Application

The purpose of dispersant use is to decrease the amount of oil that may strand on shorelines or reduce its presence on the sea surface to prevent wildlife and habitat impacts. Oil that is dispersed into the water column reduces the volume of oil on the ocean surface and reduces the potential for impact on emergent receptors. This is achieved by breaking the oil down into small droplets, which are rapidly dispersed into the water column and away from the ocean surface. Through dispersant use, the process of natural dispersion and biodegradation is accelerated as more oil droplets are formed, increasing the surface area of the oil which increases the reaction rate of the biodegradation.

As some of the oil will not be able to be effectively sprayed using aerial operations, VOGA will also implement marine dispersant application operations. These operations will be directed (as part of the IAP) to operate in areas likely to result in the greatest effectiveness of the dispersant; and in such a manner as to allow for other oil spill marine operations.

Dispersant application will only be carried out while the spill response impact assessment, SIMA, demonstrates that the application is providing a net environmental benefit and that the

application will minimise the overall ecological, socio-economic and cultural impacts and promote rapid recovery.

This will be determined through the assessment of dispersant efficacy testing results, daily SIMA, metocean forecast modelling and operational monitoring outcomes. Laboratory based efficacy testing of the dispersants available to VOGA on Wandoo crude has been assessed and described in Section 4.1.3.

7.4.2 Dispersant Application

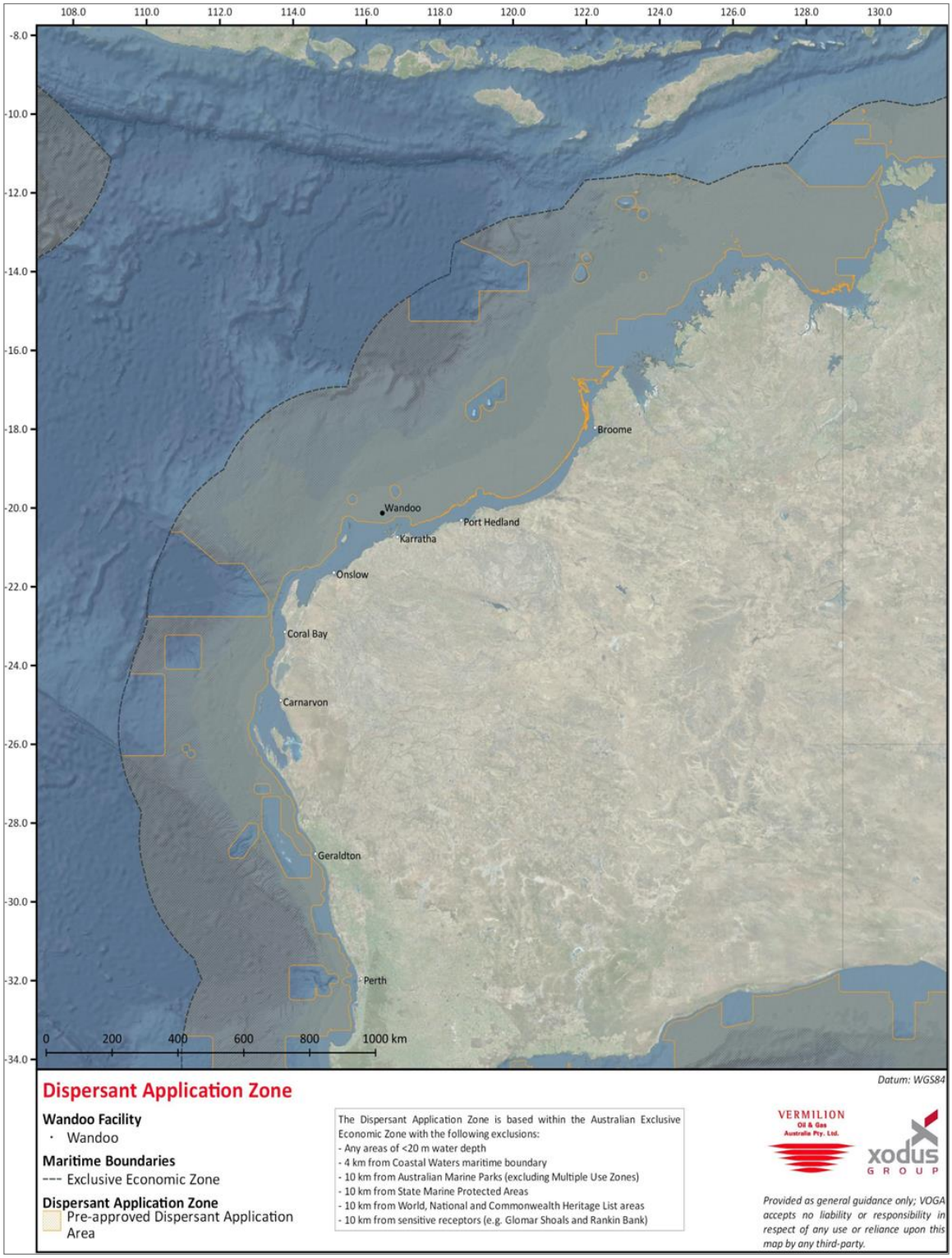
7.4.2.1 Dispersant Application Zone

Dispersant application may occur within the Australian Exclusive Economic Zone shown in Figure 7-1 and with the following exclusions:

- Waters shallower than 20 m
- 4 km from Coastal Waters maritime boundary
- 10 km from Australian Marine Parks (excluding multiple use zones)
- 10 km from State Marine Protected Areas
- 10 km from World National and Commonwealth Heritage List areas
- 10 km from sensitive receptors (e.g. Glomar Shoals and Rankin Bank).

Initial application of dispersant will be focused on the area surrounding source of the continuous spill to target the freshest crude oil and maximise the potential benefits of dispersant application. Additional application will be based on the trajectory of the oil, the SIMA and location within the dispersant application zone.

Figure 7-1 Dispersant application zone



7.4.2.2 Decision Making Process

During a spill response, the decision to apply dispersant to oil will be made via the IAP process. The IAP is supported by a SIMA utilising real-time operational information, such as metocean conditions, spill location and dispersant application, combined with trajectory modelling. This decision will be based on the potential impact of dispersant application, considering quantity, exposure and sensitivity, against potential reduction in the environmental impact. This will be done by assessing the effectiveness of dispersant, including the following parameters:

- **Dispersability**: For this operational activity, the effectiveness of the dispersant will be continuously monitored during application, with results fed back to the IAP and NEBA processes.
- **Sensitive receptors**: the following will be considered when undertaking the decision-making process:
  - Minimum time to oil contact on sensitive receptors: If dispersant application can increase the contact time this would potentially allow for protection or shoreline strategies to be implemented to further reduce the impact.
  - Average and maximum volume of oil on sensitive receptors: If dispersant application reduces the scale of impact, this not only reduces the immediate impact but may also reduce the size of response activities within that area – potentially resulting in reduced disturbance of environmental sensitivities in shoreline or shallow water.
  - Average and maximum length of shoreline contacted by oil: If dispersant application reduces the scale of impact, this not only reduces the immediate impact but may also reduce the size of response activities within that area – potentially resulting in reduced disturbance of environmental sensitivities in shoreline or shallow water.
  - Probability of oil contact on sensitive receptors: A reduction in the probability of oil contact to sensitive receptors reduces the potential risk level of the event.
  - Change in proportion of surface and entrained oil: The application of dispersant may result in an increase in the extent of potential zones of entrained hydrocarbons. This is compared to the potential reduction in volume of oil to shoreline and maximum length of shoreline contacted by the oil, to see if there is a net benefit to the application of dispersant.
- **SIMA**: This will assist in assessing the exchange of one impact for another. This process will be continually re-evaluated and updated during an incident and will balance the trade-offs between benefits and impacts. Chemical dispersants will only be applied if there is net benefit to the priority sensitive receptors from its application.
- **Forecast modelling**: This will be completed every day during the oil spill incident to ascertain if the movement of oil as a result of current, weather and sea conditions will result in a net benefit to priority sensitive receptors. If the modelling indicates that the application of dispersant under current environmental conditions will lead to increased deposition of hydrocarbons on priority sensitive receptors, dispersant will not be applied.
- **Marine water quality monitoring**: As part of operational monitoring activities, water quality monitoring will be conducted in conjunction with dispersant operations and samples will be analysed for dispersant and hydrocarbons (dissolved and entrained). Real-time results from these operational monitoring studies will inform the SIMA.

- **Response performance objectives**: These will be evaluated for compliance of measurement criteria. Any non-compliance will be identified as part of the IAP process and could result in the termination of chemical dispersant application.

7.4.2.3 Quantity of Dispersant

ITOPF (2014c) Technical Information Paper 4 (TIP 4) Dispersant use provides a method for determining the volume and application rate of dispersant. The two parts to the calculation are:

- Determining the volume of oil to be treated
- Determining the volume of dispersant required for that volume of oil.

Calculating the Volume of Oil to be Treated

ITOPF suggests that although there are variations in the thickness of oil within a slick, most fresh crude oil spills spread within a few hours so that the average thickness is 0.1 mm (also referred to as 10^{-4} m) and says *"this thickness is often used as the basis upon which to plan operations"* which means that the volume of oil in one hectare (10^4 m^2; 10,000 m^2) is calculated as:

Step 1. Calculating the volume of oil in one hectare

- For planning purposes we will use 1 m^3/hectare for spills with an average thickness of 100 g/m^2 (0.1 mm). This is based on the following:
  - Thickness of oil x area = volume of oil
  - Assuming density 1 kg/m^3 and even spreading 100 g/m^2 has thickness of 10^{-4} m.
  - 10^{-4}m (thickness of oil) x $10^4$$m^2$ (area of oil) = 1 m^3 or 1,000 litre of oil.

Calculating the Volume of Dispersant Required

The dispersant-to-oil ratio (DOR) can range from 1:10 through to 1:50 or even less depending on the oil, dispersant types and the method of dispersant (aerial or vessel). For aerial planning purposes, a DOR of 1:20 is used because it is an accepted ratio to start with and may be adjusted depending on effectiveness. A DOR of 1:20 is also used in OSTM studies that have been used in this OPEP for evaluating the impact of dispersant use. ITOPF TIP 4 says the calculation to determine dispersant quantity is using a DOR of 1 part dispersant to 20 parts oil (1:20) (ITOPF, 2014c).

Step 2. Calculate the volume of dispersant required

The dispersant quantity required per hectare is 50 litres. This is based on:

- Dispersant quantity = litres of oil/20
- Using the calculation in Step 1, dispersant quantity per hectare = 1,000 litres of oil in 1 hectare/ 20 = 50 litres per hectare.

VOGA has assumed that FWADC is capable of delivering 1.8 m^3 of dispersant per sortie (although some aircraft may be capable of more) (Table 7-4). Four Fixed Wing Aerial Dispersant Capability (FWADC) aircraft flying five sorties each and delivering 36 m^3 of dispersant in total will cover approximately 720 hectares per day. VOGA has assumed that the OSRL aircraft is capable of 8.2 m^3 per sortie, with a possible five sorties per day.

Table 7-4: Potential area covered and volume of dispersant that could be applied per day via aerial dispersion

No. of aircraft	Potential area (hectares) that could be covered at a rate of 50 litres per hectare				Potential volume that could be applied (m^3)			
	No. of sorties				No. of sorties			
	1	5	10	20	1	5	10	20
1	36	180	360	720	1.8	9	18	36
2	72	360	720	1,440	3.6	18	36	72
3	108	540	1,080	2,160	5.4	27	54	108
4	144	720	1,440	2,880	7.2	36	72	144

Calculating the Volume of Dispersant Required

The significant variation in oil thickness within a slick means that in practice it is impossible to evaluate the optimum dosage precisely. ITOPF (2014c) recommends that the practical and most efficient solution is to target the thickest parts of the oil. Therefore, to accommodate for the uncertainty in the total area to be treated with dispersant (i.e. due to wind rows, dispersant evaporation, and variability in slick thickness), 50% of the spill area has been used as the target area to calculate dispersant required, from which real time planning will then be done.

For the purposes of this OPEP, a continuous spill due to loss of well control during well exploration was evaluated with a scenario of a 26,678 m^3 surface release of Wandoo crude over 35 days following a loss of well control from the exploration wells which is approximately 762 m^3/day of oil released, assuming a consistent flow rate. A DOR of 1:20 would require approximately 38 m^3/day of dispersant to be applied.

These continuous spill scenarios assume the oil to be located in the dispersant application zone and for the oil to be an appropriate thickness for dispersant efficacy (100 g/m^2). An area 18 km x 18 km (32,400 hectares) closest to the surface release point will be prioritised for dispersant application activities and application areas outside of this zone will be determined based on the trajectory of the oil. This priority zone is within the pre-approved zone of dispersant application (Figure 7-1).

Four aircraft conducting five sorties each per day, with an additional sortie for one aircraft, could achieve the required daily dispersant application target of 38 m^3 covering an area of 720 hectares.

Within the OSR Capability Review [VOG-7000-RH-0009], a dispersant budget analysis was undertaken considering dispersant stockpile volumes, locations, mobilisation and transport times and methods, customs and consumption rates. In the event of an OSR, the 'live' Dispersant Spreadsheet can be utilised to update stockpile status and optimise the logistics arrangements in real time.

Marine Vessel Application Rates

The ICT Planning Chief will work with the Logistics Chief to ensure that the optimum combination of aerial and vessel based dispersant application is used to achieve efficient dispersant stockpile use.

Calculating the volume of oil to be treated for marine vessel operations is the same as for aerial dispersion. However, a DOR of 50:1 is used for vessel dispersant planning as the dispersant droplets do not need to be as a higher concentration as aerial application. In addition, dispersant applied using the Afedo spray system is diluted before application, thus reducing the volume of dispersant required.

VOGA determined that a vessel travelling at 4 knots for 10 hours a day continuous spraying, can cover approximately 75 hectares.

7.4.3 Operational Constraints for Dispersant Application

In addition to 'no go' zones, constraints may also include:

- Metocean conditions
- Availability of suitable vessels, aircraft and personnel for dispersant activities
- Mobilisation times
- Thickness of the slick
- Weather conditions and available daylight.

Seasonal environmental conditions and sensitivities will dictate spray runs and areas. An analysis to determine these specific sectors will be undertaken at the time by the Planning Team and implemented by the Aviation and Marine Units.

7.5 Mechanical Dispersion

7.5.1 Description of Mechanical Dispersion Operations

Mechanical dispersion is the use of fire monitors, engine wash, or other means to mechanically/ physically disperse oils into the water column, thereby increasing the speed with which weathering and biodegradation occurs. This strategy is a secondary strategy that may be considered for Wandoo crude spills that result from activities within the Wandoo Field.

Mechanical dispersion has the benefits of:

- Assisting natural dispersion and biodegradation of oil
- Requiring less response personnel as it does not require booms or skimmers like in the containment and recovery strategy
- Eliminating waste storage and disposal issue
- Being able to treat areas that aerial and vessel dispersant operations may not be able to access or are lower priority areas for chemical dispersant application.

Mechanical dispersion operations may be activated for the loss of well control scenario described in this OPEP, but not for diesel spills, if the information collected through monitoring and evaluation suggests:

- The slick is moving toward a sensitive receptor
- The weathered oil is amenable to mechanical dispersion

- A safe operating environment for responders.

7.5.2 Operational Constraints for Mechanical Dispersion

A sea state that is not suitable for containment and recovery operations assists the mechanical dispersion response strategy. Vessels deployed to undertake this operation must be capable of working in the sea-state conditions that are current and forecast.

Mechanical dispersion will not be undertaken in areas of less than 20 m depth water.

7.6 Containment and Recovery

7.6.1 Description of Containment and Recovery

Booms and skimming equipment can be used to create physical barriers on the water surface to contain and recover the oil spill where information and predictive spill fate modelling indicate a likely threat to environmental, social and cultural sensitivities. This strategy is often used in the offshore environment in close proximity to the hydrocarbon source. Once contained, an attempt to recover the hydrocarbons from the surface waters can be undertaken.

Containment and recovery, subject to amenable weather conditions and equipment limitations, will be one of the strategies in an oil spill, to corral and physically remove spilt oil from the ocean, using different types of vessels and booming configurations.

Priority of the implementation of tasks to support this strategy will be focused on containing and recovering oil that has not been successfully chemically dispersed, and to remove as much oil as feasible from the marine environment to prevent it from potentially impacting the shorelines of the Dampier Archipelago and the Barrow, Montebello, Great Sandy and Lowendal Islands as well as the mainland of the WA coastline.

The aim of this strategy will be to have on-water ‘containment and recovery’ strike teams. This will require regional and state resources, and will be directed (as part of the IAP) to operate in areas where oiling of environmental sensitivities will result in most harm to those sensitivities. This analysis will be undertaken at the time by the Planning Chief and implemented by the Marine Unit within Operations.

If this option is considered suitable through assessments and situation awareness (SIMA, trajectory to sensitivities, weather, seas state, oil type), significant logistical support will be required that will include suitable vessels, experienced crew, booms and skimmers, pumps, on-board storage for recovered oil and aircraft to direct the vessel to the areas with the thickest surface oils.

7.6.1.1 The Boom Encounter Rate

The Boom Encounter Rate (BER) is a planning tool to assess the effectiveness of booming strategies. It provides planners with an indication of the amount of oil that could potentially be contained in booming activities, which leads to an understanding of recovery and waste requirements.

The BER can be calculated from the AMSA contingency planning guidelines (AMSA, 2015):

- The length of boom employed (referred to as LB) and the consequent "swathe" of the boom array, i.e. the opening of boom array. For planning purposes, the swathe is 30% of the total boom length being deployed.
- The speed (velocity, V) at which the boom array can be effectively operated. For planning purposes, this is assumed to be 1 knot (1,852 m/h).
- The average thickness (T) of the oil.
- The "percentage cover" of the oil or chemical on the sea surface. For planning purposes, this is considered to be 100% during the initial stages of the response operation.

The BER is therefore calculated as follows: BER = (LB x 0.3) x V x T.

The AMSA guideline recommends that oil thickness be determined through modelling. Table 7-5 provides indicative slick thickness and estimate BER and assumes a standard boom length of 300 m. This indicates that the BER appears to reduce by an order of magnitude over 24 hours, and so is likely to be 10% as effective on day two of a response as day one. At-sea containment and recovery of oil may not be efficient or effective depending on the sea state and how far the slick has spread. These activities will depend on the conditions of the day.

Table 7-5: Indicative BER (planning targets) (Table 14 of AMSA OPEP guidelines)

	Time (h)	1	2	3	4	6	12	24
Group II Oil	Thickness (mm)	0.217	0.128	0.094	0.076	0.056	0.034	0.020
	BER (m^3/h)	36.2	21.3	15.7	12.7	9.3	5.7	3.3
Group II or III Oil	Thickness (mm)	0.474	0.283	0.207	0.167	0.123	0.074	0.044
	BER (m^3/h)	79.0	47.2	34.5	27.8	20.5	12.3	7.3

The BER information in Table 7-5 is based on the spreading coefficient and assumes no wind or current; once these are factored into the calculation, the BER will change and it also assumes the spill is instantaneous (i.e. not loss of well control). They are used as a basis from which to begin planning, continuous flow of oil to the surface from loss of well control may present a situation where the BER is greater than what is planned for.

Wandoo crude is described by APASA as a Group IV oil, however, that is based on the residual component at a boiling point of >380°C. Wandoo crude for response planning purposes can be considered a Group III oil because it floats, the pour point is not less than -30°C, and the viscosity is less than 1500 cP (pers comm 6 September 2013, Paul Irving, Scientific Officer, AMSA). Therefore, for the purposes of estimating the BER, a thickness of 0.044 mm is used.

The following assumptions were used:

- Large weir skimmers such as the GT185 and the Walosep weir skimmer have recovery capacities up to about 65 t/h (~65 m^3/h).
- Assuming an operational rate of recovery of one-third of that capacity (due to sea-state and oil type), then skimming could potentially yield approximately 20 m^3/h.
- Using an operational rate of recovery over 4 hours of operation per day, a potential volume of 80 m^3/day could be recovered.

- At sea recovery is heavily dependent on the viscosity of the oil, wind speed and wave height.
- If three marine vessel teams could be deployed with the large weir skimmers and boom to contain and recover oil from the thickest part of the leading edge of the slick and if they recovered 20 m^3/h over 4 hours each then a total of 240 m^3/day could be recovered by skimmers (20 m^3 x 4 hours x 3 teams). However, this would be limited on the amount of oil that could actually be corralled by the booms (as calculated above in the BER assumptions).
- The percentage of oil (from the oil and water mix) that is able to be recovered by large weir skimmers ranges from 50% to 90%.
- Assume in these scenarios that the skimmers achieve an efficiency of 50%, then for every 10 m^3 of liquid recovered, 5 m^3 would be oil.

Containment and recovery can be used to recover oil to prevent it impacting on environmental, social and cultural sensitivities. Containment and recovery may be effective on Wandoo crude as it is a persistent crude oil with a high specific gravity and viscosity. Depending on metocean conditions, containment and recovery is expected to have a removal rate of 10% to 15% (ITOPF, 2014b). Containment and recovery will be used if metocean conditions are suitable and if oil is of suitable thickness.

Containment and recovery operations are likely to be activated if the information collected through monitoring and evaluation suggests:

- The slick is moving toward a sensitive receptor
- Sea-state and weather conditions allow effective boom and skimmer deployment
- The weathered oil is able to be recovered with skimmers
- A safe operating environment for responders.

At-sea containment and recovery is planned for an initial 20 days with further planning of marine operations evolving as the response to the incident progresses. A 20-day containment and recovery campaign with 10 operational days that contains 240 m^3 of surface oil per day could potentially reduce the surface oil by 2,400 m^3 and possibly prevent shoreline oiling. Consideration of the recovery rate of available skimmers and the likely percentage of oil recovered would be made as part of the SIMA and risk assessment process.

7.6.2 Operational Constraints for Containment and Recovery

Containment of fresh, volatile oil should not be attempted due to its low flash point. No attempt should be made until the safety of the area has been established. Containment of lighter oils such as marine diesels is often not viable because it evaporates and dissipates quickly.

The limiting factor for the effectiveness of at-sea containment and recovery is the BER and the efficiency of skimmers – all of which are heavily dependent on sea-state and weather conditions.

The efficiency of skimmers offshore and in near-shore environments are limited primarily by the encounter rate (amount of oil that can be corralled and skimmed); sea state; viscosity of the oil and weather conditions. Minimum thickness of oil considered viable to contain and recovery is

10 g/m^2. The BER, skimmer recovery rate and percentage of oil recovered have all been considered in planning for this strategy.

Booms fail (release oil) due to entrainment, drainage failure, splash over, critical accumulation, submergence, planning or equipment failure (breakage) (Fingas, 2013). The OSRL field guide for containment and recovery describes deployment techniques and strategies to minimise boom failure. Thickness of the slick is one of the main limiting factors for containment and recovery operations.

In addition to the oil properties, sea-state and wind conditions directly affect how effective containment and recovery techniques will be. Suitable metocean conditions are detailed in OPP 2.

7.7 Protection and Deflection

7.7.1 Description of Protection and Deflection Operations

Protection and deflection, subject to amenable weather and sea conditions as well as equipment operational limits, is the use of physical barriers to separate oil from environmental sensitivities, or to deflect to other areas where it may be naturally collected, or deflect it to other areas where the oil will do less harm.

Near-shore resources can be protected by the impact of oil through the use of booming configurations that either redirect oil or prevent impact by exclusion. Oil may be directed onto a shoreline to be recovered and in that case a shoreline cleanup operation is undertaken.

Booms can be used to create physical barriers on the water surface to protect sensitive receptors. This strategy involves a combination of near-shore booming using vessel-based operations (‘near-shore operations’) while the spill remains on a predicted shoreline impact trajectory, and the placement of shoreline boom around areas to:

- Protect sensitive shorelines
- Deflect the oil back to ocean or to easier locations for shoreline cleanup
- Reduce the volume of oil impacting sensitive shoreline habitats to ALARP
- Align the response strategy with NEBA.

Protection and deflection operations are likely to be activated if the information collected through monitoring and evaluation suggests:

- Sensitive receptors are predicted to be impacted by oil
- The slick is greater than 10 g/m^2 thick
- Sea state and weather permit boom deployment
- A safe operating environment for responders.

The EMBA includes a number of coastal and island shorelines, with a probability of between 78% and 90% impact on the Montebello Islands and Barrow Island at a threshold of >10 g/m^2 over a shoreline length of 13–49 km. On these islands, there are a number of priority sensitivities that

could be protected through the use of protection and deflection strategies, including mangrove areas, turtle nesting beaches and significant bird habitats (seasonal dependant).

Shoreline impacts may occur about 69 hours (RPS, 2024a). During this time the protection and deflection sites will be identified and prioritised. The implementation of this strategy in these areas may result in a better outcome than allowing the oil to strand.

7.7.2 Operational Constraints for Protection and Deflection

Booms require suitable sea state and weather as per the containment and recovery strategy. Metocean limitations for boom deployment are generally:

- Maximum sea state (Beaufort Scale) of 3–4
- Maximum current (knots) of 1–2
- Maximum wind speed (knots) of 14–22.

7.8 Shoreline Cleanup

7.8.1 Description of Shoreline Cleanup

Shoreline cleanup involves removing or monitoring oil with the objectives to:

- Minimise exposure hazards to human health
- Speed recovery of impacted areas, if possible
- Reduce the threat of additional or prolonged natural resource impacts.

Generally oil that is stain, film or sheen is less than 1 mm thick and is extremely difficult to remove from substrate and is usually left to recover naturally with wave action, or if it is a man-made structure that is oiled, response options such as pressure cleaning may be utilised. A SIMA will need to be carried out before shoreline cleanup operations commence, to ensure that attempts to remove weathered oil do not result in more of a negative impact than leaving the oil there.

Shoreline cleanup will implement a three-stage methodology using strategies identified in Table 7-6:

- Emergency phase – collection of oil floating close to the shore and pooled bulk oil removal
- Project phase – removal of stranded oil and oiled shoreline material that cannot be cleaned in-situ
- Polishing phase – final cleanup of light oil contamination and removal of oil stains, where the incident NEBA demonstrates this is necessary.

Personnel requirements for these response strategies will vary. Worst case estimates for manual cleanup have been provided in OPP 2 based on OSTM outputs for the worst replicate simulation for a loss of well control scenario.

Table 7-6: Shoreline cleanup methods

Method	Description
Natural recovery	Natural recovery allows the shoreline to recover without intervention; this minimises environmental impact caused by cleanup activities by allowing nature to degrade and remove oil from the shoreline.
Physical cleaning – removal/disposal	
Manual cleanup	Manual cleanup and recovery using shovels, rakes, hand scrapers and sieves. This is the preferred option for cleaning inaccessible shorelines of those where mechanical cleanup is undesirable.
Mechanical cleanup	Mechanical cleanup is undertaken using bobcats, front-end loaders, graders, scrapers, beach sieving machines and beach cleaning machines. These can be used to rework beach sediment or to push such sediment into the shoreline for cleaning by the waves.
Vacuum systems	Vacuum systems may be portable hand-operated systems or vacuum trucks. Vacuum systems tend to pick up large volumes of water with the oil and so it is preferable to use them on oil pooled on the sediment surface or to remove oil from containers or dams in which the water has been decanted. One method to minimise the amount of water removed from the beach is to use light, portable vacuum systems to deposit oil-water into temporary storage containers on the beach, allow settling time and to decant the water. Large units can then be used to collect the oil from these containers and transport oil to storage sites. Vacuum systems can also be used in association with deflection booms to recover oil from the sea surface. It is advisable in this case to fit the hose with a broad Manta Ray head.
Use of sorbents	Two types of sorbent materials can be used: (1) loose, powdered or granular sorbents, or (2) solid, pads, rolls or sheets. Each of these may be either of synthetic or natural fibre. As a general rule, loose sorbent materials are not used because they are difficult to recover. However, there are occasions when this is not considered to be a problem, such as in high-energy areas where oily sorbent materials can be expected to be washed off of surfaces and dissipated to sea. Of course, oil too is likely to be washed off such shorelines, to dissipate. Solid sorbents may be used in the form of sorbent booms to recover light oil films or as pads or rolls to absorb free oil from the surface of sediments in cases where vacuum systems cannot gain access or where oil is too fluid for manual recovery.
Physical cleaning – washing	
Low-pressure flushing	Low pressure flushing can be used, with care, to remove surface oils from most beach-type surfaces. The water can be applied at ambient temperature or heated depending on the oil's viscosity and/or degree of weathering and on ecological constraints. It is important that re-floated oil is collected in booms or other containment devices and recovered using skimmers or sorbents.
High-pressure flushing	High-pressure washing is to be used only on solid man-made surfaces such as wharves, jetties, etc. This method tends to emulsify oil and consequently the use of sorbents to collect re-floated oil is not recommended. Oil, which is removed from surfaces, can be collected within light in-shore booms or onshore using Shore Guardian or a similar boom. Oil can be recovered using vacuum systems or skimmers.
Steam cleaning	Steam cleaning uses a moderate jet of steam that will remove oil from almost any surface. In addition to the physical forces of the steam jet, it raises the temperature of the adhered oil, thereby lowering its viscosity and allowing it to flow off a surface. This is not recommended for surfaces that support living plants or animals.

Method	Description
Sand blasting	Sand is applied to the structure at high velocity using sand blasting equipment. The oil is removed from the substrate by the abrasive action of the sand. It is used to remove thin accumulations of weathered oil residues from rock surfaces, man-made structures, or other impermeable surfaces with relatively few or no living organisms attached where the other techniques are not applicable or feasible.
Physical cleaning – in situ	
Surf washing/ sediment reworking	Sediments are relocated to the surf zone to permit the natural cleansing action of waves to remove oil which has penetrated into beach sediments (mostly fine gravel and cobble) and which is not removed by normal wave action from the surface. The sediments are returned to the upper portions of the beach within a relatively short period through natural wave and tidal action.
Treatment	
Bioremediation	Bioremediation is the term to describe a range of processes that can be used to accelerate the natural biodegradation of oil into simple compounds such as carbon dioxide, water and biomass. Bio-stimulation is the application of nutrients and bio-augmentation or seeding is the addition of microbes specially selected to degrade the oil.

Shoreline waste generation can be reduced by identifying shorelines likely to be impacted and pre-cleaning the shore of debris and vegetation before oil strands, thus reducing the total amount of oily waste to dispose of. Shoreline waste generation can range from three to over 10 times the amount of oil stranded. In-situ cleanup techniques are ideal for minimising the generation of waste and are particularly suited to remote area response where the logistical requirement associated with waste management and transfer can be a limiting factor.

The Guidelines and Strategies for Oil Spill Waste Management in Arctic Regions (Polaris, 2009) reported that *"the key factor in waste generation is neither the amount of oil spilled nor the amount of shoreline that is oiled. The volume of waste generated during a response operation is a function of the nature of the spill (type and volume of oil, natural weathering processes) and location and length of oiled shoreline, combined with the decisions made by spill managers who select the treatment and clean-up methods and the level of effort (treatment end points)."*

This information, although from a different geographical region, is considered relevant to shoreline response teams working in remote locations in northwest WA because of the same logistical constraints posed by working in remote locations. Consideration will be made in the VOGA IAP process to ensure that response techniques and waste management as described in Section 14 are aligned so that the overall generation of waste is minimised.

Shoreline cleanup operations are likely to be activated if the information collected through monitoring and evaluation suggests:

- Shorelines are predicted to be impacted by oil at a thickness greater than 100 g/m^2
- A safe operating environment for responders.

Modelling outputs for the loss of well control scenario show that shoreline impacts are forecast in both unmitigated and mitigated scenarios for both spill scenarios in the B16 well OSTM. Dispersant application was not modelled in the Wandoo Exploration OSTM, however, the mitigated B16 well OSTM scenario provides a suitable proxy for response planning involving dispersant application.

For the Wandoo Exploration OSTM scenario (RPS, 2024a) of 26,678 m^3 over 35 days, the probability of any shoreline contact of an unmitigated spill at or above the low threshold of 10 g/m^2 is 100% during the winter season.

In the B16 OSTM (RPS, 2024b) scenario, the greatest volume of oil predicted to come ashore from an umitigated spill was 4,550 m^3 during summmer conditions. Dispersant application is assumed to reduce the volume ashore by approximately 45% as per the B16 well OSTM outputs (RPS, 2024b).

The minimum time to contact for unmitigated spills was approximately three days. This timeframe is significant for the mobilisation and implementation of operational and scientific monitoring plans particularly shoreline assessment as well as protection and deflection and shoreline cleanup activities.

7.8.2 Determining Worst Case Shoreline Cleanup Scenarios

VOGA has utilised the Wandoo Exploration OSTM data (RPS, 2024a) to identify the worst case shoreline cleanup scenarios and capability required. These simulations do not consider the impact dispersant use would have as a mitigation measure. Dispersant in other Wandoo crude OST simulations is known to have a positive impact on shoreline contact.

The shoreline oiling analysis of OSTM results encompass all segments that are contacted by oil. Ongoing identification of shoreline segments using real time data will inform ongoing shoreline cleanup response efforts during a response to an incident.

Not all shorelines presented in the OSTM output will be contacted by oil at the same time. The stochastic model ran 100 simulations for each season (summer, transition and winter) using the same spill information (release location, spill volume, duration and oil type) but varied the start time. Once the simulations were complete, the results were overlaid. This approach ensures that the predicted transport and weathering of an oil slick is subjected to a range of current and wind conditions. The stochastic model output does not represent the extent of any one spill trajectory (which would be significantly smaller) but rather provides a summary of all trajectories run for each scenario.

7.8.2.1 Priority Coastline Sections

Coastline sections for the OSTM assessment were defined by dividing the coastline into polygons aligned with the shoreline cells from the WA Marine Oil Pollution Risk Assessment Protection Priorities (https://www.transport.wa.gov.au/imarine/preparedness-response-resources.asp) and Western Australia Marine Oil Pollution Risk Assessment (WAMOPRA).

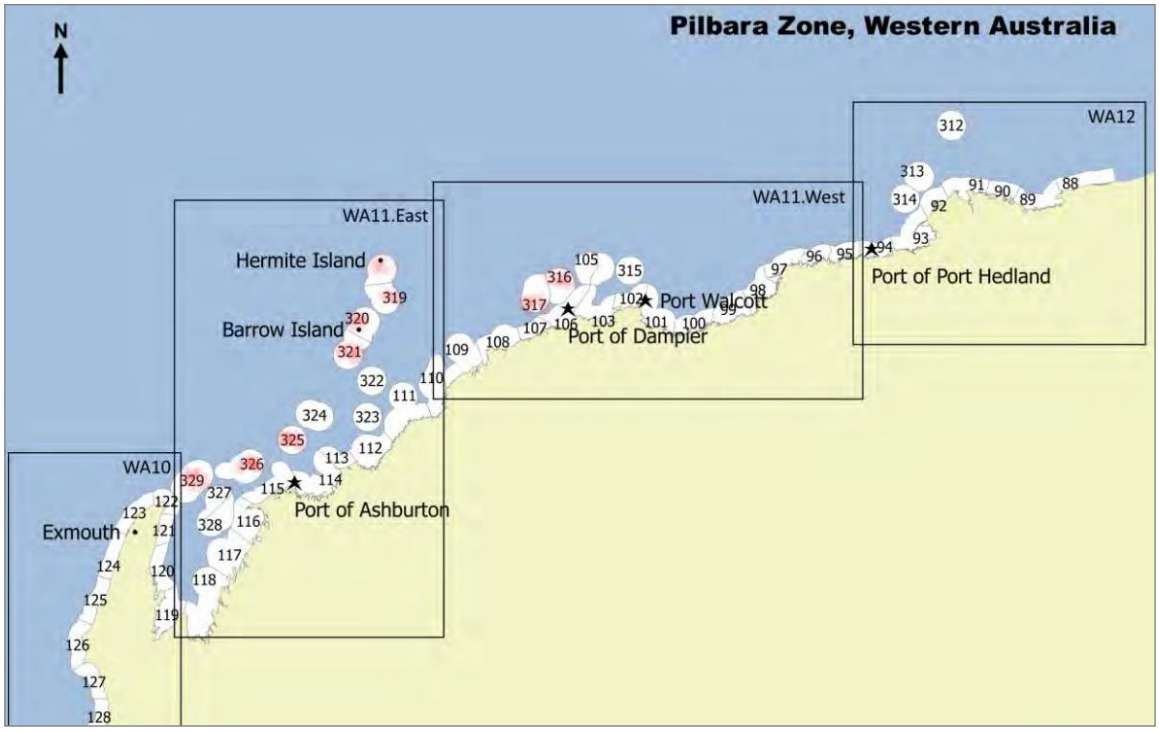
OSTM shoreline contact data was sorted and arranged according to the parameters:

- Minimum time to contact
- Probability of shoreline contact
- Maximum volume of oil ashore.

The result from this process was the identification of nine priority coastline sections (highlighted red in Figure 7-2) covering:

- WA11.East(316) – West Intercourse Island – Dolphin Island N point (F)
- WA11.East(317) – West Intercourse Island – Dolphin Island N point (G)
- WA11.West(318) – Barrow Island and Montebello Islands (A)
- WA11.West(319) – Barrow Island and Montebello Islands (B)
- WA11.West(320) – Barrow Island and Montebello Islands (C)
- WA11.West(321) – Barrow Island and Montebello Islands (D)
- WA11.West(325) – Coolgra Point W – Yardie Landing (C)
- WA11.West(326) – Baresand Point – Entrance Point E
- WA11.West(329) – Locker Point – Baresand Point.

Figure 7-2 Pilbara shoreline cells and sub-zones (DoT, 2018)



7.8.2.2 Priority Coastline Sections within Marine Reserves or Marine Parks

Within the nine priority coastline sections identified, there are three Commonwealth Marine Reserves and two WA Marine Parks:

- Montebello Commonwealth Marine Reserve
- Montebello Islands Marine Park (WA Marine Park)
- Barrow Island Marine Park (WA Marine Park) and Class A Nature Reserve
- Dampier Commonwealth Marine Reserve.

Refer to the Wandoo Field Exploration Drilling EP for a description of these areas. VOGA identified this worst-case scenario to recognise the environmental values associated with these reserves and parks. It is also important to note that the Barrow Island Marine Management Area is adjacent to the Montebello Island Marine Park.

7.8.3 Shoreline Cleanup Personnel and Equipment

7.8.3.1 Shoreline Cleanup Personnel Capability and Productivity

When determining shoreline team numbers, VOGA will take into account guidance from shipping and oil and gas industry references including IPIECA (2015) and ITOPF (2014d):

"The potential performance of the workforce is difficult to judge until work has commenced and has been underway for some time. For this reason, deciding on how many workers are required on a shoreline is best achieved by establishing a small-scale operation on a representative section of the shoreline and then replicating this approach with the appropriate level of manpower in other areas of the shoreline, once working practices have been optimised. The number of people required will be determined by the demands of the clean-up technique employed and the amount of material that can be reasonably handled within a day" (ITOPF, 2014d).

"In general it is more efficient to start with a smaller number of teams, properly set up worksite with logistics support in place, and monitor the progress of the deployed teams. A reassessment of what further work is required can then be made and a decision taken on whether changes in the number of personnel are merited, either up or down" (IPIECA, 2015).

VOGA plans to deploy shoreline cleanup teams made up of 10 workers supervised by one team leader. This provides a span of control of 10:1 as per IPIECA (2015) guidance:

"As shoreline operations progress and the tasks become more routine, the number of workers each team leader can manage effectively may increase to a worker: team leader ratio higher than the initial planning levels of 10:1" (IPIECA, 2015).

Not all sections of the coastline will be accessible or amenable to manual shoreline cleanup activities – for example, cleanup teams would not be able to access mudflats or mangroves. A re-assessment of the number of personnel required and productivity of cleanup teams will be made once shoreline cleanup activities have taken place and real-time data regarding shoreline oiling has been obtained by SCAT teams.

Shoreline cleanup personnel capability required and estimated time to complete bulk removal of oily waste is presented in Table 7-7.

Table 7-7: Shoreline cleanup potential waste and personnel requirements

Scenario	Potential waste generated in bulk oil removal [1]	No. of people required for bulk oil removal [2]	Estimated time to complete bulk removal of oily waste [3]
Maximum accumulated volume (m^3) along this shoreline with concentrations >100 g/m^2 in the worst replicate simulation (winter). WA11.West (318) Barrow Island and Montebello islands within 4.5 days.	2,565 m^3 Bulking factor of 10 Potential bulk oil waste removal 25,650 m^3	45 teams = 450 people plus 45 team leaders Total 495 people scaled up from 10 teams by day 3 to 45 teams by day 5	Collecting 450 m^3 per day = 57 days cleanup

1. Bulking factor of 10 is used to estimate waste volumes within the bulk oil removal stage (emergency and project phases) of shoreline cleanup activities.
2. Ten people per team, each estimated to collect 1 m^3 of oily waste per day. Team leaders are not factored into the productivity estimates.
3. Based on 10 m^3 collected per team per day.

Bulk oil removal refers to oil collected during the emergency phase (collection of oil floating close to the shore and pooled bulk oil removal) and the project phase (removal of stranded oil and oiled shoreline material that cannot be cleaned in-situ). During cleanup, a mix of oil and oily waste is collected. For planning purposes, potential waste generation is based on a bulking factor of 10 as per IPIECA (2015).

VOGA is using the guidance provided by IPIECA (2015) that one person can collect 1 m^3 of oily waste per day. Based on this guidance, one team of 10 workers can collect 10 m^3 of oily waste per day. Waste volumes would be altered if mechanical removal or in-situ cleaning activities such as surf washing or flushing were applied.

Time to complete bulk oil removal (emergency and project phase) is based on the ability of each team collecting 10 m^3 of oily waste per day. The estimated time to complete bulk oil removal is described as:

$$\#\ days = \frac{volume\ (m3)}{\text{productivity (m3)}} \text{ where } productivity = \#\ teams\ x\ 10\ m3.$$

The polishing phase of shoreline cleanup will be under the guidance of a SIMA and SCAT survey recommendations. VOGA recognised that although effective manual cleanup activities are generally limited to oil with a minimum thickness of 100 g/m^2, there may be instances depending on the location and vulnerability of sensitivities within that location which necessitate additional cleaning activities be undertaken. An example of this is if a turtle nesting beach has been contacted by oil during turtle nesting season. Additional cleanup activities in the form of a polishing phase may be recommended through the SIMA process to minimise oil contact with nesting turtles or hatchlings. Alternatively, high value recreational or commercial areas may need additional cleaning through high-pressure cleaning of seawalls or jetty structures so that amenity can be restored.

VOGA's SIMA of polishing phase cleanup activities will take into account five broad questions, as suggested in IPIECA (2015):

- Is the remaining oil a potential source of harm to environmentally sensitive receptors?
- Would further cleaning do more harm than good?

- Does the oil interfere with the aesthetic appeal or recreational use of the shoreline?
- Does the residual level of contamination adversely affect economic resources or disrupt economic activities?
- Does the effort involved in further cleaning outweigh environmental or economic benefits that could be achieved?

Resources to support the polishing phase would be sourced through the same arrangements in place for the emergency and project phase of shoreline cleanup.

7.8.3.2 Shoreline Cleanup Team Leaders

Trained team leaders will lead the cleanup teams to ensure activities are carried out according to instructions provided by the ICT and aligned with the Performance Standards described in the Wandoo Field Exploration Drilling EP. Shoreline cleanup team leaders will have completed shoreline cleanup training and will be responsible for supervising the activities within their team. Within Australia, these team leaders can be sourced from the AMOSC core group, AMOSC mutual aid, AMSA National Response Team, or the WA DoT State Response Team. Internationally, team leaders can be sourced from OSRL.

7.8.3.3 Key Arrangements in Place to Support Shoreline Cleanup Activities

VOGA is planning to initially equip and maintain 100 people over the first 10 days (based on shoreline contact at day 3) scaling up to 450 people during day 20 to day 57.

Appendix 2 of the OSR Capability Review [VOG-7000-RH-0009] details the shoreline cleanup kits and personnel protective equipment (PPE) available for immediate use in Dampier. Additional kits and PPE can be sourced through Perth-based suppliers.

VOGA has contracts in place for supply base and logistical services in the event of an oil spill. These arrangements include the provision of transport and drivers, supply base areas and equipment, waste disposal equipment and laydown areas, mechanical equipment, and emergency accommodation camps. Where camping on islands is not possible, vessels or floatels may be used to accommodate teams working offshore. Accommodation can be sourced onshore through camp providers that supply accommodation and catering; and transport of personnel to offshore and onshore locations can be provided by local bus and vessel operators as listed in the VOGA Emergency Response Logistics Plan [VOG-7000-0008].

VOGA, in consultation with DoT as HMA for MOP, has access to local emergency management personnel through the City of Karratha Local Emergency Management Committee and the wider Pilbara District Emergency Management Committee who can undertake or facilitate support roles as per the WA emergency management arrangements.

Shoreline cleanup workers can be sourced from labour hire providers identified in the VOGA Emergency Response Logistics Plan [VOG-7000-0008]. The Dampier Port Marine Oil Pollution Group can support response efforts and provide local knowledge to facilitate access to islands for shoreline cleanup. Access and operations on islands will be guided by the findings of the SCAT surveys in relation to suitable landing locations within the vicinity of the operations area to be set up. These locations can be pre-empted in the Tactical Response Plans for shoreline cleanup and activated, if required.

Hire or event management providers will be used to provide amenities such as toilets, shade, tables and chairs. This equipment can be transported via shallow draft vessels and barges operated by AMS and other vessel providers. Cleanup equipment such as sorbents, near shore booms and skimmers can also be sourced from the AMOSC, AMSA and AMS stockpiles and transported by vessel.

VOGA has arrangements in place for temporary waste storage including skips, intermediate bulk containers (IBCs) and containers as well as long term waste disposal solutions. These will be deployed via barges to islands and via truck on the mainland for remote waste collection. Refer to Section 14.1 for further details on oil spill waste management.

Mechanical equipment, such as all-terrain vehicles, four-wheel drives and buses, may be hired or purchased through local providers or transported from Perth. Earthmoving equipment may be suitable for specific shoreline types, such as front-end loaders, graders, bobcats and skid-steers. This equipment can be hired locally through local providers or ex Perth.

Minimum resources for establishing shoreline cleanup operations have been listed in Table 11-16. Mechanical support has been estimated based on the number of work zones to be set up, some may support a number of shoreline teams in each zone by providing bulk removal of waste. This is a minimum requirement for planning purposes that will be re-assessed in an actual spill response.

7.8.4 Operational Constraints for Shoreline Cleanup

The major constraint for shoreline cleanup is the thickness of the oil on the shore. Oil needs to be at least 100 g/m^2 thick to enable effective manual cleanup. The National Plan Environment and Scientific Working Group developed Foreshore Assessment and Termination Guidelines (2007) that suggest shoreline oiling of a thickness of <0.01 cm (100 g/m^2) which can be seen as a stain, should be left to self-clean through wave action only.

Other constraints include:

- Amenability of shoreline habitats to manual cleanup activities
- Access to remote islands and mainland beaches
- Biosecurity issues associated with moving people and equipment between remote islands and the mainland
- Access to sites (habitat, terrain, distance from the mainland, landing/mooring sites for vessels)
- Transport of equipment to remote sites
- Weather and sea state
- Hazardous wildlife.

7.9 Oiled Wildlife Response

7.9.1 Description of Oiled Wildlife Response

VOGA Oiled Wildlife Response (OWR) efforts are guided by the WA Oiled Wildlife Response Plan (WAOWRP) and the Pilbara Region Oiled Wildlife Response Plan (POWRP) developed by AMOSC and DBCA.

VOGA's role in OSR will be to facilitate response actions that will provide coordinated, immediate and effective protection, rescue and rehabilitation of wildlife during marine pollution incidents.

VOGA's primary objectives in relation to oiled wildlife are to:

- Maximise the best achievable and practicable protection measures to wildlife and their habitats during marine pollution incidents
- Minimise the risk of impacts to oiled wildlife and wildlife threatened by oil
- Minimise injuries to wildlife threatened or impacted by other operational activities associated with the response (e.g. containment and cleanup, dispersant application, aviation etc.)
- Provide achievable care for wildlife in line with best practices
- Return as many rescued wildlife back to the wild
- Document any impacts observed from the marine pollution incident or associated operational activities
- Prevent injuries to responders and the general public from wildlife associated with the incident and OWR actions search and rescue of oiled wildlife.

OWR may be implemented for any spill event and is dependent on the surveillance conducted as part of operational monitoring. If wildlife are present within the spill area or have the potential to be oiled as a result of oil stranding on shorelines, then OWR will be activated.

7.9.2 Operational Constraints for Oiled Wildlife Response

Operational constraints that may arise during OWR include:

- Access to remote islands and mainland beaches
- Biosecurity issues associated with moving people and equipment between remote islands and the mainland
- Access to sites (habitat, terrain, distance from the mainland, landing/mooring sites for vessels)
- Weather and sea state
- Available daylight
- Hazardous wildlife.

7.9.3 Response Structure

7.9.3.1 Oiled Wildlife Response in Commonwealth Waters

For oil spills emanating from offshore oil and gas operations within Commonwealth waters, the designated control agency is VOGA, and NOPSEMA is the jurisdictional authority. In the event that wildlife is affected, the jurisdictional authority for wildlife is DBCA, whilst the DoT is the designated control agency.

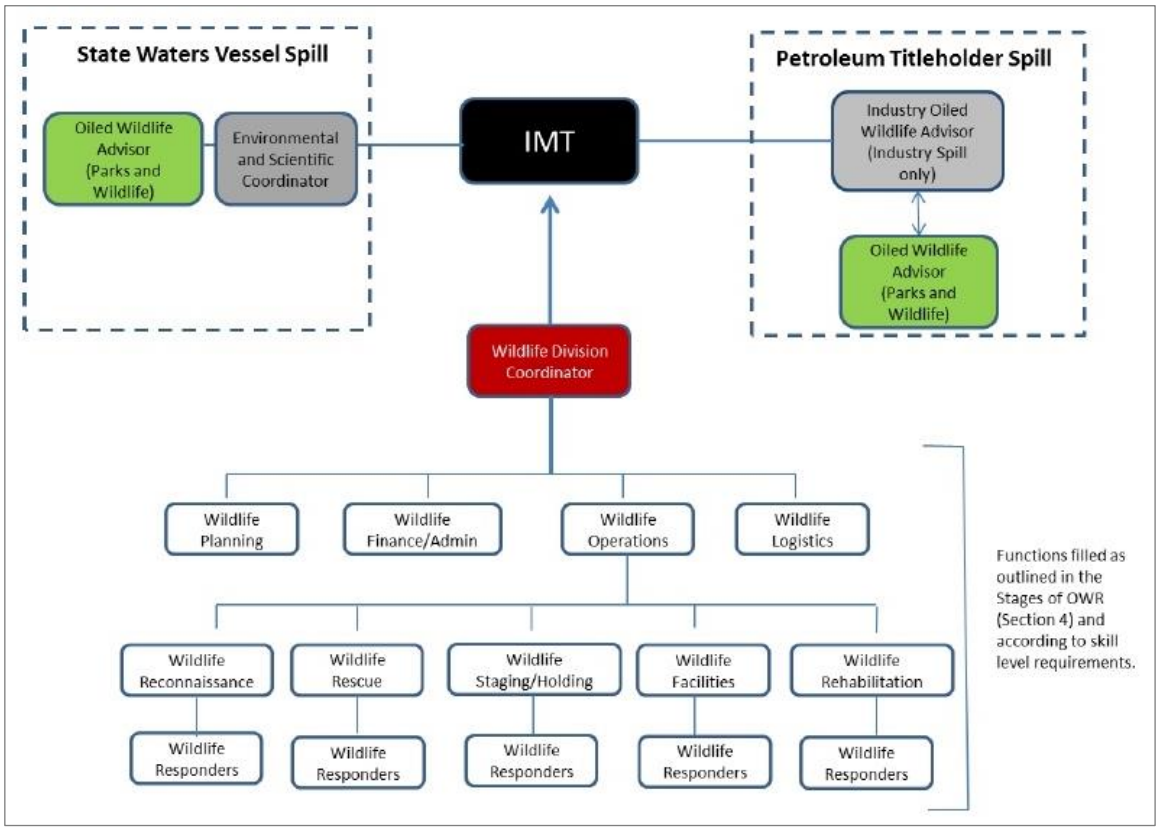
7.9.3.2 Oiled Wildlife Response in WA State Waters

Under the *Biodiversity Conservation Act 2016*and Regulations, DBCA is the jurisdictional authority responsible for ensuring a minimum standard of treatment, protection and destruction of oil-affected wildlife. In this instance, DBCA, the DoT and VOGA will work together to coordinate the OWR.

In any event where DBCA is not leading the response, an Oiled Wildlife Advisor (OWA) from DBCA will be placed in the VOGA ICT to ensure standards are being adhered to and licences for pre-emptive capture and deterrence activities can be granted and administered promptly, when deemed necessary.

Figure 7-4 presents the WAOWRP (2014) expanded structure for an OWR. An industry Oiled Wildlife Adviser and Wildlife Division Coordinator is appointed in consultation with DBCA.

Figure 7-3: Wildlife response structure with DoT as the control agency (WAOWRP 2014)



7.9.4 Approach to Response Planning

OWR planning was conducted according to the response planning process outlined in Section 3. This process aligns with the concepts presented in the IPIECA Good Practice Guide 516 Wildlife Response Preparedness (IPIECA, 2104).

Analysis of OSTM data for a loss of well control with no dispersant applied and across all seasons was undertaken to identify the initial protection priorities for wildlife (RPS, 2024a). Shoreline cells identified in the DoT WAOPMRA were used in the OSTM and the following parameters were analysed to determine the priority receptors for OWR:

- Probability of oiling at a threshold of 10 g/m^2
- Minimum time to contact at a threshold of 10 g/m^2
- Maximum length of shoreline impacted (km).

The shoreline cells were filtered further to identify those that are known to be turtle nesting sites and China-Australia Migratory Bird Agreement (CAMBA)/Japan-Australia Migratory Bird Agreement (JAMBA) sites. By applying these response planning parameters to the OSTM analysis, VOGA has an understanding of the scale and extent of the operational area including a timeframe for scaling up oiled wildlife capabilities. First strike priority areas, subsequent operational areas and the timeframe in which to deliver oiled wildlife capabilities required to these areas has been identified from this sensitivity analysis. OWR planning has been framed around the first strike priority shoreline segments identified for:

- Montebello Islands
- Dampier Archipelago
- Barrow Island
- Legendre Island
- Delambre Island.

These shoreline sectors align with the POWRP Operational Sectors 9, 10 and 12 and are the focus for VOGA response activities in the first 10 days of response activities. In addition to the on-ground work during this time, scaling up and activation of resources for staging areas and additional oiled wildlife facilities to be available beyond day 15 will take place (PWORP Operational Sectors 13 and 14).

Table 7-8: Alignment of priority shoreline segments with POWRP operational sectors

OSTM shoreline segment	POWRP operational sector	Staging area and temporary holding sites	First strike equipment	Preventative measures
Montebello Islands	12	DBCA research hut at Hermite Island. Barrow Island. On water station.	Nearest first strike equipment is in Karratha.	Pre-emptive capture of turtles (particularly juvenile life stages). Various hazing techniques may also be useful for moving wildlife out of risk areas.

OSTM shoreline segment	POWRP operational sector	Staging area and temporary holding sites	First strike equipment	Preventative measures
Barrow Island	10	Coastal access points, DBCA office, Barrow Island Camp, on water station.	Must be sent as freight by air or sea and comply with Barrow Island quarantine requirements. Nearest first strike equipment is in Karratha.	Pre-emptive capture of turtles may not be possible so hazing is the preferred option given access constraints.
Dampier Archipelago	9	Dampier Port. Dampier Peninsula Palms.	Nearest first strike equipment is in Karratha.	Pre-emptive capture of turtles (particularly juvenile life stages) and fairy terns should be considered. Various hazing techniques may also be useful for moving wildlife out of risk areas.
Legendre Island – Searipple Passage				
Delambre Island				

7.9.5 Response Actions

VOGA will coordinate the initiation of OWR activities and assist ongoing OWR operations through facilitating access to assets such as aircraft and marine vessels, staging areas, transport, waste management and personnel as identified in the OSR Capability Review [VOG-7000-RH-0009]. Once activated, the WAOWRP has eight stages, with stages one to three being undertaken in the Oiled Wildlife Emergency Response Plan (OWERP) and the remainder initiated as part of the IAP process for the incident.

Species-specific response strategies have been described in the WAOWRP. A summary of these in relation to the risk assessment (Astron, 2012) is provided in Table 7-10. VOGA's response capability has been developed taking into consideration the eight stages of OWR and the species-specific response strategies that may be implemented.

All response strategies will be developed by the Wildlife Planning Officer in collaboration with the Wildlife Operations Officer with advice from the Wildlife Division Coordinator and the industry Oiled Wildlife Advisor. These form the basis of the IAP oiled wildlife sub-plan which includes:

- Wildlife priorities for protection
- Exposure modification measures
- Recovery and treatment of oiled wildlife
- Resourcing of equipment
- Personnel requirements.

The Incident Commander approves the oiled wildlife sub-plan as part of the IAP process managed by the Planning Chief.

Table 7-9: Stages of OWR (WAOWRP, 2014) applied to a loss of well control scenario

Response phase	Stage of OWR	Description
OWERP	Stage 1 – Wildlife first response	The first strike OWR activities provide the initial response of the wildlife division, the OWA has already been stood up at this stage. Activate the WAOWRP and the POWRP. Rapidly assess the situation using the SITREPS generated by Planning. Provide advice to the IMT in relation to the wildlife assets at risk. The Wildlife Division Coordinator and OWA will activate and mobilise the first strike OWR equipment in anticipation of an OWR to ensure timely availability of equipment: 6 x OWR first strike kits to be deployed from Karratha to the staging areas of POWRP operational sectors 9, 10 and 12 (Montebello Island, Dampier Archipelago, Barrow Island, Legendre Island and Delambre Island.
OWERP and IAP	Stage 2 – Mobilisation of resources	Supplement provision of first strike kits from Karratha with kits held in Exmouth and Fremantle. Mobilise a Wildlife Operations Officer to Dampier to lead the mobilisation of operational resources at the scene when oiled wildlife have been observed. Further personnel mobilisation along with equipment, and facility acquisition needs to occur ahead of need if wildlife impact is anticipated. Mobilise 2 x OWR containers to Dampier oiled wildlife facility location. Activate provision of additional OWR containers to be deployed to Port Hedland. Activation of the OWL personnel selection, training and induction programs.
OWERP and IAP	Stage 3 – Wildlife reconnaissance	Real-time wildlife reconnaissance is necessary to ground-truth information contained in the regional OWR plans due to seasonal and inter-annual variation in abundance and distribution of wildlife. The Wildlife Division Coordinator will request access to reconnaissance through the IMT Operations Officer. The Wildlife Planning Officer should commence a plot of all known wildlife communities in the local area that may be affected; the hazing and encounter/capture can then be determined from this plot. Note: Reconnaissance and capture of wildlife should be performed by people with specific expertise to ensure that uniformly reliable information is fed back to the planning section to enable informed decisions. Wildlife reconnaissance conducted in conjunction with OSR Shoreline Cleanup Assessment Teams will provide efficient use of resources. There may, however, be circumstances where separate operations are desirable. Aerial observation has its limitations in wildlife reconnaissance, these include altitude, visibility and risk of disturbance to wildlife.

Response phase	Stage of OWR	Description
IAP	Stage 4 – IAP wildlife sub-plan development	The IAP wildlife sub-plan will be developed by the Wildlife Planning Officer in collaboration with the Wildlife Division Coordinator. Information gathered from the regional OWR plan and real time wildlife reconnaissance will inform the development of the sub-plan. The sub-plan will include the appropriate response options for oiled wildlife, including: • Wildlife priorities for protection from oiling • Deterrence measures • Recovery and treatment of oiled wildlife (provided by Wildlife Planning Officer & Field Coordinator); resourcing of equipment and personnel. The Wildlife Division Coordinator and OWA will discuss activation and mobilisation of OWR resources in anticipation of OWR to ensure timely availability of personnel and equipment. The OWA will then discuss recommendations with the Incident Commander for approval of the sub-plan and mobilisation of OWR resources and personnel.
IAP	Stage 5 – Wildlife rescue and staging	Refer to species-group specific response strategies described in Table 7-9. **Exposure modification (prevention of oiling through wildlife deterrence or pre-emptive capture)** Where wildlife is at risk of becoming impacted by oil, strategies to prevent this should be explored. Strategies directly involving wildlife comprise pre-emptive capture and hazing. Pre-emptive capture requires that safe means of capturing a significant proportion of wildlife at risk be available, together with the capacity to care effectively for them in captivity, and a workable plan for re-release when risk has been eliminated. Hazing (the scaring of unoiled wildlife away from oiled habitats/areas) requires an effective deterrent system, and satisfactory alternative sites for animals deterred from at-risk sites. There are many commonly used methods and devices to haze animals including aircraft, vessels, cracker shells, gas cannons, predator recordings, and predator effigies. Careful consideration of the particular circumstances must be given as significant deleterious effects may ensue from poorly planned or executed hazing operations. Any deterrence/hazing/pre-emptive capture activities will require licensing authority from DBCA through the OWA and operational approval from the Incident Controller. The DBCA OWA enable rapid access to department licences to undertake approved activities. OWR rescue operations should determine the best combination of pre-emptive capture, hazing and the collection and management of oiled animals based on resources available. **Wildlife rescue, transport and staging/holding** Wildlife search operations to enable wildlife field collection are planned using input from the IAP considering triage principles, in addition to geographical areas expected to have been impacted by the incident.

Response phase	Stage of OWR	Description
		Differentiation of the functions: a) Finding oiled wildlife b) Capturing and holding wildlife c) Transporting wildlife to oiled wildlife facilities should be made. All three functions may be performed by a single team or functions could be split into separate teams. A staging site will provide a logistics base for search and capture teams, and shelter and quiet for animals waiting to be transported to a primary care oiled wildlife facility. Stabilisation may be initiated at the staging site if prolonged transport is anticipated. Wildlife can be held in transport cartons if suitable ventilation and protection from weather is provided. A field collection team should comprise at least three individuals for safety and effectiveness, however, teams larger than this may be more suitable depending on transport and communication requirements, the length of coastline affected, and how dispersed casualties are. Where individual animals have not become immobilised, specialised species-specific capture strategies may require large teams. Field teams return captured wildlife to the staging site, from where the Wildlife Rescue and Staging/Holding unit leaders direct their efforts and liaise with the transport unit. A field staging site would permit stabilisation and staging for transport if staffed by a wildlife intake unit comprising a vet, veterinary technician, and a scribe. Public information announcements should be arranged on local television and radio to discourage participation by untrained members of the public in attempts to capture and collect wildlife and direct volunteers to an induction training location.
IAP	Stage 6 – OWR facility	Activate pre-identified OWR facilities in Dampier (Section 5.1.3 of the POWRP) and in Port Hedland (Section 5.1.5 of the POWRP). The Dampier facility will be required to be operational by day 3. Port Hedland facility will be required to be operational from day 15. Access to a site for the purposes of an oiled wildlife facility will be confirmed by the Wildlife Division Coordinator following the acknowledgement of an escalation of the response by the Incident Commander and the approval of resource mobilisation. Priorities for establishing the Oiled Wildlife Facility during the First Strike Response period is to rapidly provide for the intake and holding capacity of oiled wildlife, with other functions added on in additional phases. **Note:** An overall space requirement of approximately 2,500 m^2, a water flow capacity reaching 60,000 litres per day and an electrical load of 200A are conservative estimates for a centre dealing with 100–500 wildlife casualties at the facility at any one time. A temporary facility management team of up to six contractors would take 1 to 3 days to develop facilities to hold, assess, and initiate cleaning in a suitable site on-scene. Development of post-

Response phase	Stage of OWR	Description
		cleaning rehabilitation facilities in the temporary centre would be completed over the ensuing week.
IAP	Stage 7 – wildlife rehabilitation	Requirements for a rehabilitation centre are dependent on the region and the wildlife likely be admitted. Ideally, a facility will be planned with a team including trained OWR personnel, a wildlife veterinarian, a local authority representative and an experienced builder. Longer term rehabilitation requirements may defer to more permanent facilities that can cope with reduced numbers of wildlife. The requirements for housing and rehabilitation of wildlife will vary greatly depending on the size and circumstances of a spill. Short-term requirements and small numbers of wildlife may capitalise on existing wildlife care facilities for the post-washing and intensive care period of rehabilitation. For larger numbers of wildlife and longer-term incidents, on site construction of facilities may be necessary. Expert advice should be obtained in the design and setup of temporary and longer-term rehabilitation housing of wildlife. The Perth Zoo is recognised as a leading State agency in wildlife housing and can provide advice if required. Record keeping is a critical part of the management of captured wildlife whether pre-emptive or following oiling. Records must be kept from the point of capture and travel with each individual animal. On arrival at the rehabilitation centre, the wildlife should be tracked through the system on the treatment record. An Australian OWR record keeping system known as the National Plan OWR Database (NPOWRD) has been developed and can be implemented for tracking wildlife during a spill event. Important components of the system are an access database, fauna datasheets, and a database manual. Wildlife cannot be released until their habitats are remediated and deemed clear from further risk of oiling. Where pre-emptive capture is undertaken animals can be released once the habitat is clear of oil pollution. While it is preferable to get unoiled wildlife back to their natural habitat as soon as possible, in some cases the release of animals a long distance from the spill allowing them to find their own way back may be acceptable. However, advice should be sought before proceeding.
IAP	Stage 8 – OWR termination	Once the decision has been made to terminate oiled wildlife operations, the Incident Controller will stand down functions through the Wildlife Division Coordinator when the appropriate agencies agree that the incident/emergency has been satisfactorily controlled and the particular wildlife functions are no longer required. This is likely to involve a progressive stand down of different functions from the wildlife capture through to rehabilitation functions as appropriate. Ongoing resourcing may be required, beyond the termination of cleanup operations, to maintain rehabilitation of some affected animals and to conduct monitoring programs after their release. Demobilisation of the wildlife response will be guided by parameters established by the Wildlife Division Coordinator at the beginning of

Response phase	Stage of OWR	Description
		operations and incorporated into the IAP in consultation with the Incident Controller. Demobilisation of the wildlife response will be undertaken in accordance with parameters established in the IAP (termination sub-plan) and when the Wildlife Division Coordinator considers that all wildlife affected by the spill have been satisfactorily dealt with. The decision will be made in consultation with the Incident Controller, the Wildlife Advisor, and the Wildlife Division Coordinator. Demobilisation of personnel, equipment and facilities used for the wildlife response will generally lag behind that of the wider spill response because cleaning, treatment and rehabilitation of wildlife can take longer than the spill response.

Table 7-10: OWR strategy considerations and options (excerpt from WAOWRP, 2014)

Species group	Strategy considerations	Strategy options
Seabirds – sea foragers that utilise islands and coasts such as terns, gulls, boobies gannets, noddies, shearwaters	Seabirds will dive through oil on the surface if fish or other prey can be seen. This should be considered as possible for light crude, diesel and condensate spills. Seabird numbers can be highly variable seasonally and from year to year as they follow food resource abundance (affected by El Nino, etc.) and can forage long distances from nesting and roosting sites. Pre-oiling surveys are critical to ascertain current status. Birds oiled during feeding may not be able to fly back to shore, so in-water patrols of feeding areas and shorelines for capture should be considered. Seabirds often show a preference for sandy points, spits and low rocky bars near the ocean. Birds lightly oiled or coated with light oils oiled may be able to fly back to roosts where monitoring should occur and shore-based capture should be considered. Seabirds nest on islands or the mainland coast either on the surface (e.g. terns), rock crevices, in vegetation (e.g. cormorants) and in burrows (e.g. shearwaters). Nestlings and eggs are at risk of oiling from body contact with adults.	Searches for and collection of birds required in areas where oil is located, and at roosts (can be up to 50 km from oiling). Oiled birds can be captured in water and on land using hand nets, cleaned and rehabilitated. Free-flying birds cannot be readily captured in marine environments. Adults and nestlings should be monitored for oiling impacts. Oiled adults and nestlings should be captured by hand nets or other available means. Pre-emptive capture of chicks and hand raising should be considered for high conservation species.
Seabirds Cormorants and darters all species	Are predisposed to oiling as they will readily swim through heavy oils. May travel large distances from roosting sites but feed close to shore. Cormorants saturate their feathers to hunt and will look wet (indicator of light oils) after foraging when drying wings for flight. Roosting sites may vary according to wind conditions and food availability. Cormorants prefer to roost on elevated coastal headlands or trees to assist take off.	Oiled birds can be captured on land or in water. Strong birds will dive to escape capture. Nestlings should be monitored and only captured for cleaning rehabilitation if abandoned or parent birds are oiled.

Species group	Strategy considerations	Strategy options
	Nest on elevated coastal headlands and vegetation or in vegetation in freshwater swamps.	
Migratory and resident shorebirds	Habitat and survey maps and pre oiling surveys important to determine species and densities present in an area. Preferred foraging areas are extensive intertidal flats. Foraging times are tide-dependent feeding on molluscs and worms exposed in intertidal zones during mid to low tides. Birds tend to spread out over suitable feeding habitat. Feeding response to different types of oil is unknown. Birds oiled during feeding may not be able to fly back to roosts when tide rises, so in-water patrols of feeding areas and shorelines for capture should considered. At high tide periods, birds roost at favoured sites until the falling tide allows for foraging at intertidal habitats. Favoured roost site locations are critical information for OWR. Capture of unoiled birds is likely to be difficult and capture of all birds quickly is unlikely.	Oiled birds can be captured using hand nets, cleaned and rehabilitated. For small areas of oiling, hazing can be attempted with ongoing monitoring of success. Pre-emptive capture of unoiled birds foraging for food is largely impractical due to individuals dispersing to feed. Pre-emptive capture and transport or holding of birds in nesting areas under threat may be possible. Capture techniques for unoiled birds include noose mats (preferred) and cannon nets.
Resident shorebirds	Resident shorebirds nest on coastal beaches, wetland fringes and islands. Nest above the high water mark. Nestlings and eggs can be oiled by contact from adults. Hatchlings are precocial and can forage by themselves after hatching but stay in family groups for some time. Surveys need to be undertaken to determine nest locations adjacent to and along impacted shorelines. Priority should be on capture and rehabilitation of adult birds.	Oiled birds can be captured using hand nets, cleaned and rehabilitated. Nest building birds can be hazed or disturbed from projected oil impact zones.
Waterbirds	Herons and egrets tend to forage amongst mangroves and on intertidal flats or shallow pools near roosting sites. Pelicans prefer shallow protected waters for feeding. Pelicans can travel very large distances from roost or breeding sites to foraging areas. Can be found in freshwater brackish and coastal habitats. Herons and egrets common in suitable coastal and offshore island and mangrove habitats. Herons and egrets nest sparsely in coastal vegetation. Pelicans nest in colonies on inland lake and coastal islands.	Oiled birds can be captured on land or in water. Nestlings should be monitored and only captured for cleaning and rehabilitation if abandoned or parent birds are oiled.
Marine birds of prey	Ospreys often plunge into water to hunt fish, while WB Sea Eagle plucks fish from water on the wing. Brahminy Kite commonly takes crabs. All of these birds are likely to hunt mammals on Barrow Island at times. Elevated perch with view of ocean are preferred. Some perches offering protection may be used in some conditions.	Monitoring of local raptors should be undertaken, focusing on known nest sites and perches. Only specialist or experienced personnel should capture or handle these species for safety.

Species group	Strategy considerations	Strategy options
	Make large nests comprised of sticks on tall structures (trees, mangrove, manmade) or rocky headlands.	
Green turtles	In-water oiling via ingestion, inhalation and contact risks. Note that even light hydrocarbons such as diesel and condensate cause burns to turtles even though oiling may not be apparent. Sea turtles do not appear to display any avoidance behaviour on encountering a slick. Males and females at risk. All animals relatively widely dispersed through foraging habitats in near shore coastal bays. Adult males and females at risk while milling in coastal shallows. Distinct aggregation areas preferred in mating season and are priority areas for oiling protection. Greens nest on deep sandy beaches usually on exposed coasts. Adult females primarily at risk while milling in shallows and during beach egress. In-water and beach oiling via ingestion, inhalation and contact. Females at risk of oiling from oil that has landed on beaches. Barrow Island data shows an inter-nesting cycle of five years. Three nests per season with a 12 day intra-nesting interval. While nests are usually located above the high tide mark, spills can occur as a result of an extreme weather event which can cause oiling of nest areas. The zone above the nest is important for gas exchange and coating with oil can prevent this process occurring resulting in suffocation of eggs/hatchlings. It would also create a barrier for hatchlings to swim to the surface. Tests have shown that eggs impacted by fresh oil early during incubation show deformities and eggs oiled in the last half or quarter have a significant decrease in survival. The effect of oil that has naturally weathered for a few weeks prior to impact to shorelines may have little effect on nest or eggs. Use of heavy machinery or vehicles will compact nests and compromise hatchlings. Relocation of eggs needs to occur within 12 hours of laying or after 14 days (Limpus) as embryo development membranes are vulnerable to rupture. Hatchlings are at much greater risk of oiling as they spend more time near the surface, being stuck in heavier or weathered oils. They tend to be found detected in tidal current convergence zones. Hatchlings are suspected to quickly move offshore.	Adults are a large powerful turtle, and so in-water capture is generally unviable except in expanses of shallow water. Captures of compromised adults on the surface would be possible with walley nets or large hoop nets. Capture of adult females on shore can be done by hand and using turtle stretchers for transport. Juveniles >40 cm appear in coastal waters and could possibly be rodeo-ed or captured with long handle nets. Any captures need to be removed from the area and duration of oiling. At very low tides in mating season, adult males and females can be captured on large expanses of flats such as Bandicoot Bay at Barrow Island. Any captures need to be removed from the area and duration of oiling. Nesting females can be captured on shore using standard tagging techniques. Where a beach is threatened, pre-emptive capture of all animals should be considered. Any captures need to be removed from the area for the duration of oiling. There are two options: one, transport and holding of captured animals in enclosures; or two, transports away from field of oiling as far as required to prevent oiling. In both cases, a minimum of five individuals or 5% of managed animals should be tracked to gather data on strategy efficiency. Remove surface oiling manually from nests where it occurs.

Species group	Strategy considerations	Strategy options
	Hatchlings may be compromised if captured and held for long periods. Funnel fencing and pit traps techniques could be used to capture emerging hatchlings providing nesting females did not compromise trapping or were placed at risk of entanglement.	Removal of eggs for incubation probably impractical on a large scale. Research programs on effects are important. Aims and methodology should be determined prior to spill event. Low drift fencing and pit traps techniques could be used to capture hatchlings remotely providing nesting females did not compromise trapping or were placed at risk of entanglement. If females are still nesting, then hand capture of hatchlings should be attempted; this would require stationing of personnel every 1–200 m along a beach patrolling through the evening and early morning to detect and collect hatchlings. Hatchlings would need very fast transport to a suitable release site. Air transport to release site within 12 hours is essential.
Flatback turtle	In-water oiling via ingestion, inhalation and contact risks. Males and females at risk. Relatively widely dispersed through foraging habitats of turbid coastal and continental shelf environments. In-water oiling via ingestion, inhalation and contact risks. Adult males and females at risk. Distinct aggregation areas preferred. In-water capture probably unviable, may be possible to capture some females resting on beaches. At Barrow Island, the flatback turtle mating and nesting aggregation is centred around the proposed LNG tanker jetty area. Flatback turtles nest on medium to shallow sandy beaches usually on protected beaches. In many areas of the Pilbara, they are restricted to nesting during mid to high tides. Adult females primarily at risk while milling in shallows and during beach egress. In-water and beach oiling via ingestion, inhalation and contact. Females at risk of oiling from oil that has landed on beaches. Inter-nesting intervals of 1.7 to 3.0 years, three nests per season intra-nesting period of 16 days years. While nests are usually located above the high tide mark, spills can occur as a result of an extreme weather event which can cause oiling of nest areas. The zone above the nest is important for gas exchange and coating with oil can prevent this process occurring resulting in suffocation of eggs/hatchlings. It would also create a barrier for hatchlings to swim to the surface. Tests have shown that eggs impacted by fresh oil early during incubation show deformities and eggs oiled in the last half or quarter have a significant decrease in survival. The effect of oil that has naturally weathered for a few weeks prior to impact to shorelines may have little effect on nest or eggs. Use of heavy machinery or vehicles will compact nests and compromise hatchlings. In-water and beach oiling via ingestion, inhalation and contact risks.	

Species group	Strategy considerations	Strategy options
	Hatchlings are large and vigorous (Pendoley pers. com. from tracking trials hatchlings) are suspected to move to inter-island or coastal habitats. Hatchlings are suspected to quickly move offshore. Hatchlings may be compromised if captured and held for long periods.	
Hawksbill turtle	Found around reefs coastal areas and lagoons. Feeds on sponges, anemones and crustaceans. Very high protection priority as is endangered in an international context. Inter-nesting period is 3–5 years. Hatchlings are quite small compared to green turtles and flatback turtles.	
Loggerhead turtle	Found on shallow continental shelf and coastal bays. Feeds on molluscs and crustaceans. A high protection priority.	
Leatherback turtle	Pelagic ocean species. Sightings have occurred from WA coastal and offshore waters. Their massive size makes in-water capture extremely difficult.	
Dugong	Dugongs are relatively common in protected coastal waters that less than 10 m in depth. Population data is limited. Exmouth Gulf has been identified from aerial surveys to hold a significant population with most sightings at the southern and eastern end of the gulf adjacent to mangrove areas. At Barrow Island, surveys show significant numbers in Bandicoot Bay and near the Southern Barrow Shoals, however, is sighted all around the island. It is likely that similar habitats in the Pilbara will hold similar numbers of dugongs.	Dugongs can be captured by in water methods from vessels in certain conditions. They have been known to succumb to stress from temporary holding. Pre-emptive capture and transport is not considered viable. Hazing/herding away from oil slicks is a possible strategy but may only be viable in spills of small to moderate size. Aerial spotting with an aircraft and herding using vessels should be attempted if Dugongs are at risk of oiling.
Cetaceans Dolphins	Aerial surveys indicate dolphin species can be found widely from inshore coastal to offshore areas. Bottlenose and Indo Pacific Humpback dolphins are commonly seen inshore.	Acoustic hazing using towed seismic arrays under soft start protocols may be viable (consult with SME). Difficult to capture in water and are fast swimming.
Sea snakes	Most sea snakes are venomous but are not generally considered aggressive (except when covered in oil). Sea snakes appear to be susceptible to oiling from spills.	Capture and cleaning of oiled animals is possible. They should be cleaned in a similar process to birds.

7.10 In-situ Burning

VOGA does not consider in-situ burning as a suitable response option because the flash point of Wandoo crude (144°C) means that the oil is not amenable to being ignited in-situ.

7.11 Scientific Monitoring

7.11.1 Description of Scientific Monitoring

Direction of information flow is primarily from operational monitoring to scientific monitoring. Operational monitoring inform the scientific monitoring receptor studies in terms of their initiation criteria, and through provision of essential information to guide their mobilisation and establishment. Key information is the location and extent of hydrocarbons, and location and extent of impacted receptors.

Scientific monitoring is used to quantify the impact of associated response strategies, such as the use of chemical dispersants and shoreline cleanup. This information will also be provided by the oil spill monitoring response Monitoring Coordinator to the VOGA Planning Chief.

This OPEP contains the VOGA Oil Spill Monitoring Bridging Implementation Plan [WAN-2000-0001.04] as part of the supporting documents and plans. This document is the link between the Joint Industry Operational and Scientific Monitoring Framework, the Joint Industry Operational and Scientific Monitoring Supplementary Agreement and Vermilion's OPEP.

7.11.2 Operational Constraints for Scientific Monitoring

Operational constraints that may arise during scientific monitoring include:

- Access to remote islands and mainland beaches
- Biosecurity issues associated with moving people and equipment between remote islands and the mainland
- Access to sites (habitat, terrain, distance from the mainland, landing/mooring sites for vessels)
- Transport of equipment to remote sites
- Weather and sea state
- Available daylight
- Hazardous wildlife.

PART 3: Performance Management

Section 8 – Assurance and Capability Management

8.1 Overview

VOGA manages oil pollution response capability and assurance requirements through:

- Training and competency of key response personnel and contractors
- Assessing capability against response requirements
- Assurance tasks such as exercises and third-party inspections.

8.2 Training and Competency

Element 5 of VOGA's Health, Safety and Environment Management System (HSE MS) is training and competency and within that element, the Personnel Selection, Placement and Competency Assurance Manual [VOG-1000-MN-0004] outlines how VOGA manages the training of personnel. On-site Emergency Response personnel are trained in emergency control and leadership to ensure they are suitability prepared for decision making in an emergency situation.

Training requirements are identified for On-site Command and Incident Command teams to ensure rotate testing of scenarios and equipment. Records are kept to track the completed training of personnel.

Each member of VOGA's ICT will have completed incident management training as outlined in Table 8-1, giving them basic competencies and therefore requisite skills to undertake their required incident response roles. At a minimum, this means a course in ICT management for ICT members, with planning, operations, logistics, finance chief roles, and Incident Commanders having completed a training course in ICT command and control.

Table 8-1: VOGA ICT OSR training

	Incident Commander	Planning Chief	Operations Chief	Logistics Chief	Finance Chief	ICT support roles	WNB Field Superintendent
Introduction to oil spills – familiarisation session	✓	✓	✓	✓	✓	✓	✓
Manage Emergency Incidents (PMAOHS511A)	-	-	-	-	-	-	✓
PMAOMIR320 or IMO Level 2 in OSR	-	✓	✓	✓	✓	✓	-
IMO Level 3 in OSR or PMAOMIR418	✓	-	-	-	-	-	-

The Planning Chief is supported by an Environmental unit, with the minimum competency requirement for the Environment Unit Team Leader role being a tertiary qualification in marine

or environmental science (or equivalent) and a mimimum three years in an environmental role in the oil and gas and/or marine industry. Specialised skill-sets such as those required for monitoring (e.g. fluorometry, shoreline surveys), aerial observation, OWR and specialised equipment operations will be sourced from the resources available within the AMOSC Core Group, AMSA National Response Team and ESC Network, the DoT State Response Team or service providers.

8.3 Capability

8.3.1 Determining Requirements

VOGA's capability for OSR are the arrangements, contracts, MOUs, directories and agreements in place with service providers who may be involved in response efforts for an oil spill incident, assessed against worst-case scenario and documented under the OSR Capability Review [VOG-7000-RH-0009].

Determining capability for OSR requires an understanding of the strategies to be implemented and the associated resources. Resources required to support the implementation of each response strategy are identified in this OPEP. VOGA has chosen to identify capability required for Category E and F spills in the Wandoo Field Oil Pollution Emergency Plan [WAN-2000-RD-0001.02] with the assumption that a capability which applies to worst-case spill scenarios should be sufficient in terms of resource preparedness for the spill scenarios in this Exploration OPEP.

8.3.2 Assessment of Capability

Capability assessment is a step in the response planning process described in Figure 3-1. Once a capability is defined, arrangements are then tested to ensure it can be achieved and that risks are being managed to ALARP. If testing suggests the capability cannot be achieved, then an assessment of the response strategy and specified capability is undertaken.

The following questions are considered to determine capability requirements to support management of risk to ALARP:

- Are there additional tasks that can be undertaken for this strategy?
- When and where the resource would be required, based on the results of consequence modelling (e.g., time to impact, thresholds and probability)?
- How long would the resources be required for use?
- Where and what are the size of stockpiles available to VOGA?
- What are the mobilisation times for equipment from these stockpiles and contractor resources?
- What are the logistical requirements for safe deployment of materials and equipment?
- Is there any benefit of either increasing resource and/or reducing mobilisation times?
- What are the costs of either increasing resource and/or reducing mobilisation times?
- Is there any benefit in increasing the amount of resources?
- Is there a better way to undertake activities associated with this strategy?

8.3.3 Worst Case Requirements

The loss of well control scenario based on a 26,678 m^3 surface release assumes a 35 day uncontrolled release of hydrocarbons which by the nature and scale of the spill event would require resources for the duration of the spill event and post-source control. This scenario can be considered the worst case in terms of the quantity and duration resources are required for this activity.

8.3.4 Maintaining Capability for the Duration of a Response

Capability for resources are maintained for the duration of a response through the IAP process. The IAP process provides the ICT with the ability to forecast resource requirements based on real time incident data. Capability assurance will be monitored and adjusted if required to suit to the particular situation with resources for response operations beyond day 20 being identified and provided for.

The Resources Unit within the Planning Section of the ICT monitors response capability by:

- Completing a daily stocktake of resources available, enroute, deployed and no longer serviceable
- Requesting capability statements from service providers in an incident
- Comparing resource requirements of the strategies to be undertaken in the IAP with resources available.

If the capability cannot be achieved then response strategies will be reviewed as part of the IAP process to identify alternative response strategies that reduce risks to ALARP.

Resource requirements for response operations beyond 20 days are difficult to quantify, however, the scale of resources required for loss of well control incidents can be estimated by using the OSTM outputs as a guide to the geographic extent to which a response may evolve. Additional staging areas may need to be established to accommodate the geographical range of operations such as for OWR activities or shoreline cleanup. This will require access to wharf space, laydown areas for equipment, decontamination areas, waste storage and logistical support for additional personnel.

Dispersant stocks required beyond 20 days will require the support of the OSRL Global Dispersant Stockpile or just in time manufacture. The logistical planning required for activating manufacturing will require an analysis of ongoing requirements as soon as the scale of the incident is known. Time allowance will need to be made for sourcing seed ingredients, manufacture, packing and transport. As such, it is essential that if dispersant is an ongoing strategy that a member of the ICT is tasked with determining required volumes. The IPIECA Oil Spoil Response Joint Industry Project (JIP) Dispersant Logistics and Supply Planning will assist in this task. Supporting studies for dispersant volumes are provided in the OSR Capability Review [VOG-7000-RH-0009].

8.3.5 Monitoring of Capability

Capability can be demonstrated by the creation and testing of mechanisms to access and activate resources during a spill response. These include the testing of contracts, agreements, MOUs, and directories to demonstrate VOGA's capability to implement the response strategies.

Audits and monitoring are a key aspect of this OPEP. Table 8-3 provides VOGA with the opportunity to ensure that the capability put in place in place during the planning phase is maintained over the duration of activities within the Wandoo Field and are heightened during times of higher risk activities (e.g. well construction).

8.4 Assurance Activities

8.4.1 Overview

The two key performance and assurance activities are:

- Exercises
- Inspections and audits.

These activities can either be conducted internally or by a third party, including another titleholder, equipment/resource provider or OSR agency.

Exercises enable the IAP processes, team interfaces and equipment deployment to be tested to enable continuous improvement of response planning or third-party expertise. Exercises can either be desktop, simulated events or full-scale equipment deployment.

Inspections and audits are conducted to test and provide assurance to assumptions and commitments made within this plan and capability assessment.

8.4.2 Exercises

The VOGA Wandoo ERP [VOG-2000-RD-0017] ensures that strategies are in place in to manage emergencies. The VOGA Emergency Response Schedule [VOG-1100-YH-0001] addresses the scope and requirements for conducting exercises for the on-site and incident command teams.

Exercises are part of the training standards identified in the VOGA Emergency Response Schedule include:

- Onsite command exercises (Level 1): An exercise that involves the on-site command team scenario of any severity (may be conducted as a desktop exercise).
- ICT exercises (Level 2): Exercise of any severity, must involve exercising the ICT with an IAP being generated (may be conducted as a desktop exercise) and may involve one or more organisations or external agencies.
- Crisis Management (Level 3): An exercise of any severity that involves Corporate Command Team whose focus is on business continuity and media/investor relations. For these exercises, corporate communications and business continuity plans may be prepared.

VOGA uses exercises to demonstrate the ability to fulfil its roles and responsibilities in terms of emergency response to all incidents, including oil spill incidents. The overall aim of exercises is to drive continual improvement through:

- Providing situational experience for ICT personnel and enabling them to be aware of their assigned roles and responsibilities during a response
- Assessing the effectiveness, achievability and timeliness of incident action planning for the duration of expected response
- Testing interfaces between teams and deployment of equipment and resources.

The Australian Disaster Resilience Handbook Managing Exercises (AIDR, 2023) and the accompanying exercise templates are used to assist in the planning, preparation, delivery and evaluation of internally run exercises. A copy of the templates is held in Appendix C.

The VOGA Emergency Response Schedule [VOG-1100-YH-0001] provides details regarding the reporting of recommendations arising out of exercises including changes of procedure, corrective actions and new guidelines. Table 8-2 presents the exercise schedule.

Table 8-2: Testing schedule for well exploration activities

Objectives that VOGA will test	Evidence and supporting documentation required	Within 3 months before well exploration activity starts	Within 3 months after a significant change to spill profile
Aim 1: Provide situational experience for command team personnel and enabling them to be aware of their assigned roles and responsibilities during a response			
To provide an oil spill event to test the on-site or incident command team roles specifically listed in Table 8-1.	VOGA ICT exercise scenario description and attendance list.	✓	-
Aim 2: Assess the effectiveness, achievability and timeliness of incident action planning for the duration of expected response			
Test the incident response cycle.	VOGA ICT exercise scenario description, IAP and decision/event log and post scenario lessons learned.	✓	✓
Aim 3: Testing interfaces and deployment of equipment and resources			
To assess that the ICT are aware of notification protocols in place to contact other agencies, regulatory authorities and OSRAs and OSROs.	VOGA ICT exercise scenario description, IAPs, decision/event log and stakeholder/notification contact list.	✓	✓
Test the mobilisation ability and logistic assumptions around equipment and personnel movement, timings and capability.	Updates to OSR Capability Review as per Table 9-1, based on lessons learned provided to or sourced by VOGA.	✓	✓

8.4.3 Inspections and Audits

8.4.3.1 Overview

VOGA's auditing schedule includes all elements of VOGA's HSE MS, including environment performance. The auditing schedule includes three types of auditing processes:

- Internal inspections of VOGA's response capabilities and commitments
- External inspections of VOGA's response capabilities and commitments
- Inspections of third-party providers.

8.4.3.2 Inspections of VOGA Commitments

HSE MS compliance audits are conducted regularly to review management standards relating to Management, Leadership and Policy, Risk Assessments and Case to Operate, Management of Change, Training and Competency, Emergency Preparedness (including OPEPs), Management and Response, and Incident Management.

VOGA's auditing schedule includes all elements of VOGA's HSE MS, including environment performance. The auditing schedule includes three types of auditing processes:

- Internal audits are conducted by relevant VOGA stakeholders such as the Managing Director, Operations Manager and/or HSES Advisor and are focused on VOGA systems, processes and resources
- External audits are conducted by a third-party provider and are considered a "deep dive" auditing process that reviews the system design completeness and adequacy, implementation adequacy and effectiveness
- Contractor audits are focused on the activities managed by the contracting party.

8.4.3.3 Inspections of Third-Party Providers

The inspection of third-party providers is focused on confirming that systems and processes are in place to meet response expectations within some or all of the following areas:

- Equipment: maintenance management, logistics, training, readiness for activation/deployment.
- People: training and competency management, quantity and availability.
- Activation process: notification processes, activation and mobilisation of people and equipment, exercises and testing.
- Documentation: contracts, agreements, specialist services, authorisation lists, capturing of learning and input into training materials.
- Management and organisation: organisational management of change process, lessons learnt, contracts and liability.

The frequency of the inspection is dependent on VOGA's activity, requirements of mutual aid partners and size/capability of the organisation and is provided in Table 8-3.

Actions for third parties are provided in a report and progress followed at a liaison meeting or the next inspection.

Table 8-3: Inspection frequency and scope

Item	Third party OSR providers				
	OSR organisations	Key OSMP provider	OWR agency	Local/Regional oil spill equipment provider	Global dispersant
Frequency	3-yearly	3-yearly	3-yearly	2-yearly	3-yearly
Equipment: Maintenance management, logistics, training, readiness for activation/deployment	Included	Included	Included	Included	Included
People: Training and competency management, quantity and availability	Included	Included	Included	Included	-
Activation process: Notification processes, activation and mobilisation of people and equipment, exercises and testing	Included	Included	Included	Included	Included
Documentation: Contracts, agreements, specialist services, authorisation lists, capturing of learning and input into training materials	Included	Included	Included	-	Included
Management and organisation: Organisational management of change process, lessons learnt, contracts and liability	Included	-	-	-	-

8.5 Action Management

Recommendations arising out of OPEP reviews, capability reviews, inspections and audits are reviewed and divided into the following categories:

- Those that need to be addressed immediately
- Those that can be actioned and addressed in the cycle of document review and amendment, or
- Those that are not considered appropriate to be incorporated or not relevant to the Exploration and Survey Operations OPEP and are not actioned.

Where recommendations are to address an increase spill response, risk exposure identifies interim measures to manage the risk to ALARP, whilst any agreed action is being completed.

Section 9 – Continuous Improvement

The OPEP may require reviews:

- Following a significant change to a spill risk profile
- Following significant changes to OSR capability or performance standards
- Post-significant event (i.e. incident, change to risk profile, change to activities, change to preparedness/capability both within VOGA and external service providers).

Reviews will take into account any issues arising from events or exercises, any changes in legislation, and also incorporate findings and recommendations from industry incidents locally and globally (if and when information is made public).

Recommendations arising out of OPEP reviews, capability reviews, inspections, audits are reviewed, assessed and considered for implementation if it is consistent with the ALARP principles outlined in the VOGA EPs. A schedule of reviews is provided in Table 9-1.

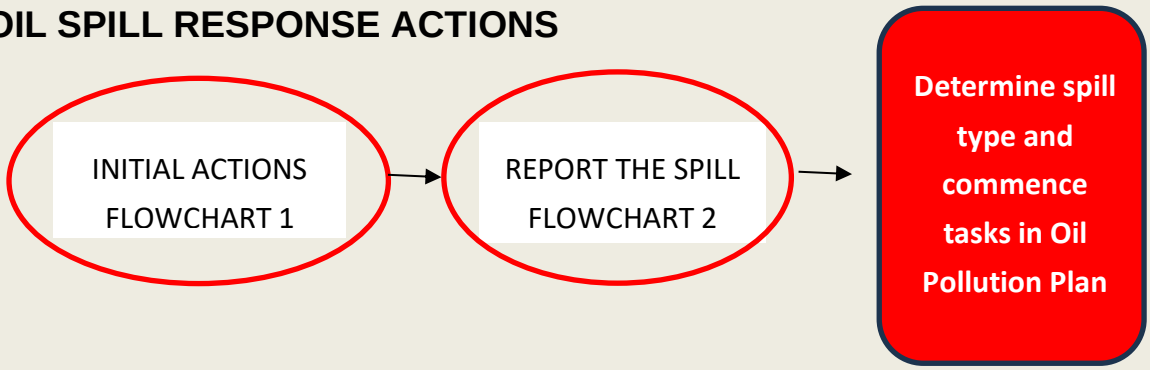
Table 9-1: Review schedule for well exploration activites

Objective	Activity type	Within 3 months before activity starts	During activity	Annually
To ensure that all contacts in the OPEP are regularly checked and updated	Contacts list check	✓	-	✓
To ensure that all service providers retain capability	Review OSR Capability Review [VOG-7000-RH-0009]	✓	-	✓
	Contractor readiness reports	-	✓	-
To ensure that response strategies are consistent with oil spill mitigation requirements	OPEP review	-	-	✓

PART 4: Activation of Oil Pollution Emergency Plan – what to do if an oil spill occurs

WHAT TO DO IF AN OIL SPILL OCCURS

OIL SPILL RESPONSE ACTIONS



OIL SPILL RESPONSE PRIORITIES

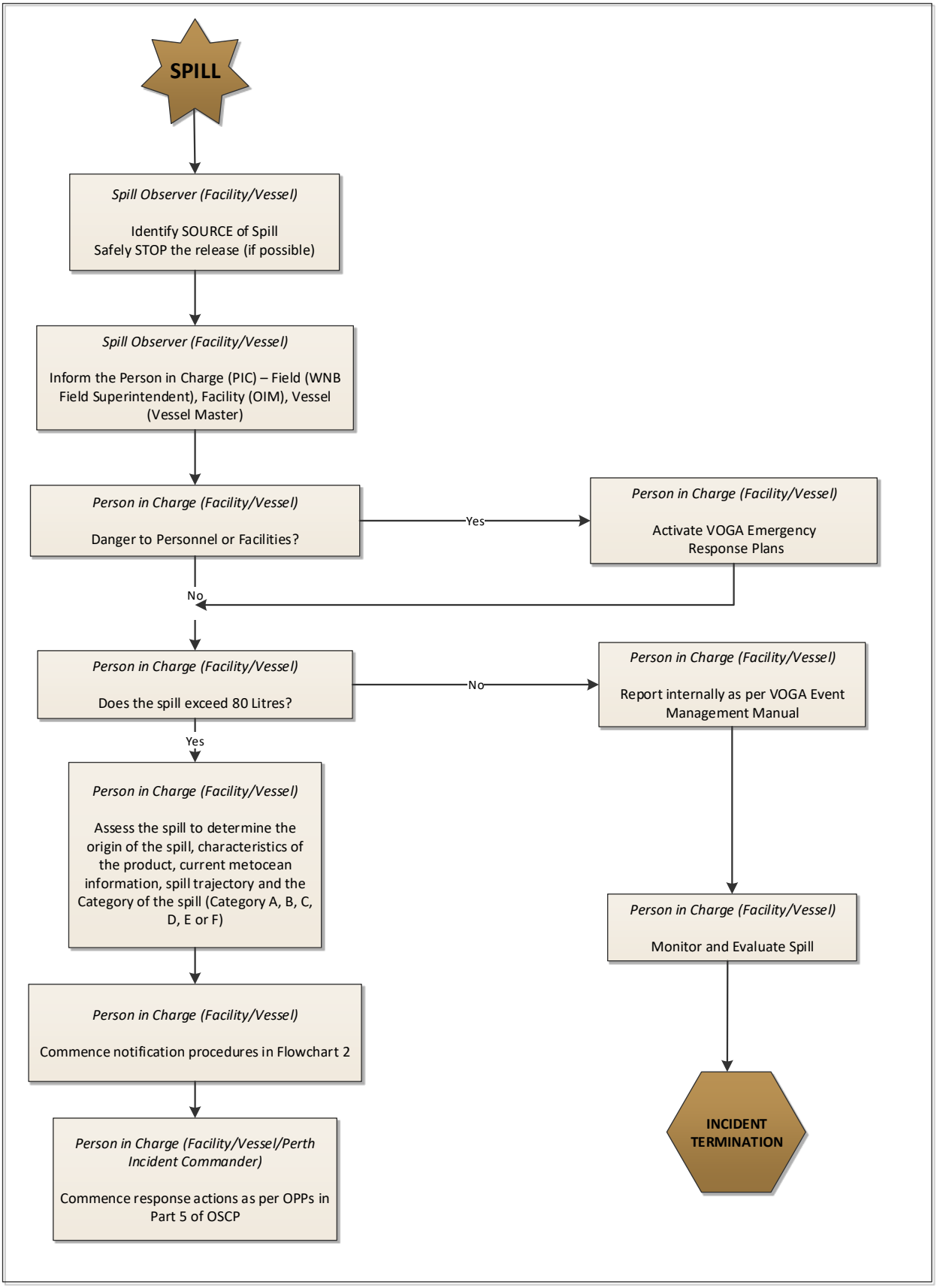
Consistent with the NatPlan, the priorities for VOGA in responding to an oil spill will be:

- Human health and safety
- Habitat and cultural resources
- Rate and/or endangered flora and fauna
- Commercial resources
- Amenities.

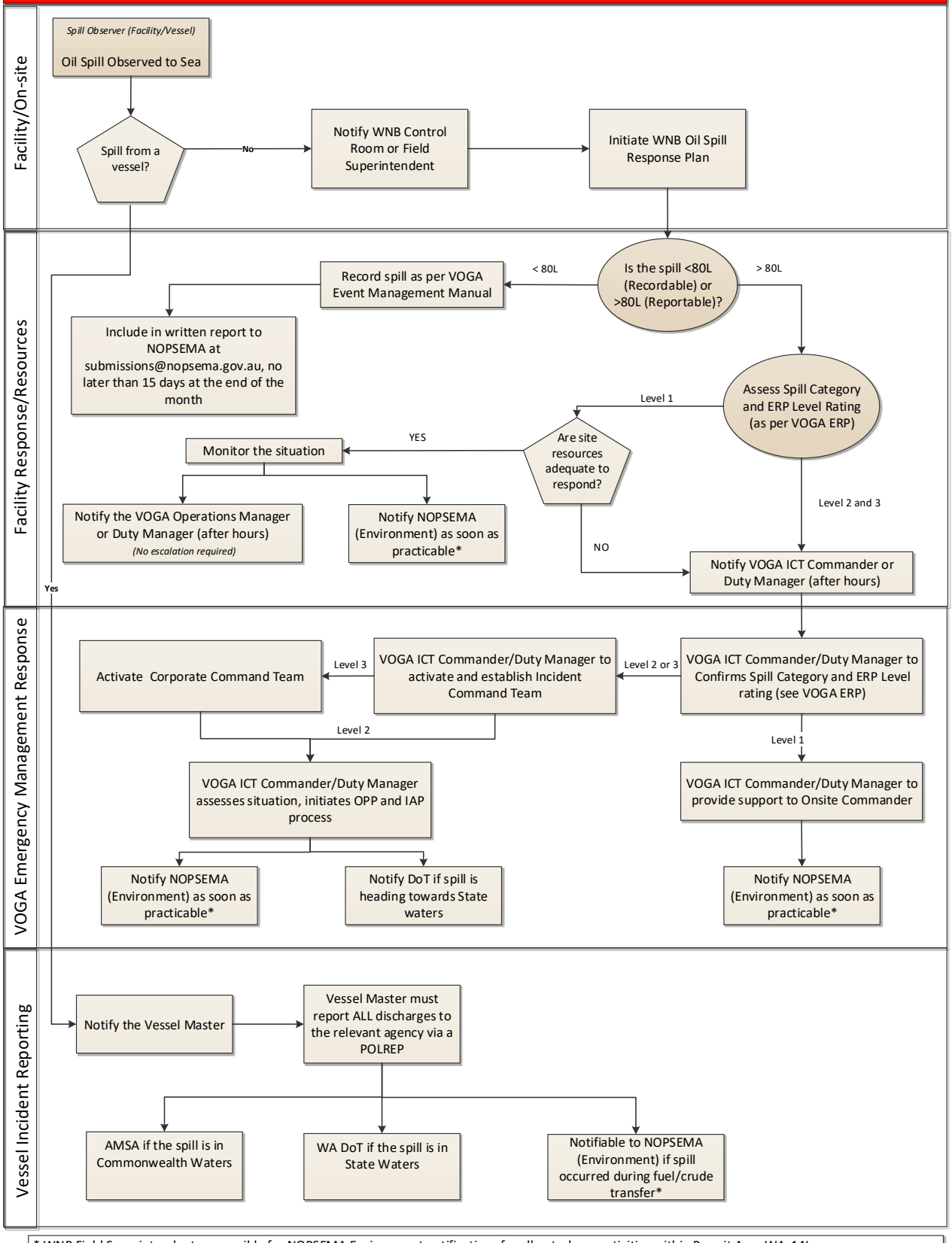
SPILL TYPE, OIL POLLUTION PLAN NUMBER AND CORRESPONDING QUICK GUIDE

Spill type	Oil Pollution Plan #	Credible upper spill volume	Product type	VOGA ERP incident level	National Plan incident level
Vessel collision	OPP 1	300 m^3	Diesel	Level 1	Level 1
Loss of well control	OPP 2	762 m^3/day (26,678 m^3)	Wandoo crude	Level 3	Level 3

FLOWCHART 1: OIL SPILL RESPONSE INITIAL ACTIONS AND ASSESSMENT



FLOWCHART 2: OIL SPILL RESPONSE REPORTING



* WNB Field Superintendent responsible for NOPSEMA Environment notifications for all petroleum activities within Permit Area WA-14L.
MODU Operator is responsible for all safety notifications to NOPSEMA for incidents resulting from activities under the control of the MODU operator.

PART 5: Oil Pollution Plans

Section 10 – Oil Pollution Plan 1 (Diesel Spill)

10.1 Instructions

- Complete the initial actions and notifications in Part 4 for activating the OPEP.
- Work through the initial incident action plan Table 10-1.
- Check off tasks that have been undertaken using Table 10-2.
- Generate a SIMA utilising the VOGA oil response tools.
- Check which OSMPs are required to be activated.
- Transition into incident IAP process.

10.2 Initial Incident Action Plan

Table 10-1: OPP Initial IAP

Incident Action Plan objectives:	Ascertain extent of spill
	Prevent impact to sensitive resources
Protection priorities	**Oil spill response strategies** (Means of accomplishing objectives)
	1. Monitor and evaluate
	2. Wildlife response

Strategies	**Tactics** (What is planned to be done?)	**Tasks** (See Table 10-3 and Table 10-5 for guidance)
Monitor and evaluate	Visual observation from vessel	Provide initial situational awareness to the PIC
		Ongoing situational awareness
	Oil spill trajectory modelling	Activate RPS modelling contract
		Manual trajectory model
	Aerial observation	Activate assets to fly as soon as possible in daylight hours only
		Analysis of aerial observation
	Situational awareness	Collection and analysis of real-time data – weather, tides, oil characteristics, presence of wildlife etc.
	Operational and scientific monitoring	Collection and analysis of OSM data.
Oiled wildlife response	Wildlife first strike response and reconnaissance	Aerial reconnaissance
		Marine reconnaissance
	Mobilisation of wildlife resources	Shoreline reconnaissance – SCAT surveys

Table 10-2: Task checklist for diesel spills

OPP 1 DIESEL SPILL – TASK CHECKLIST (first 24 hours)			
	Timeframe	**Who**	**Completed**
Tasking checklist vessel			
Start and maintain personal log.	Immediately on spill detection	Vessel Master	
Inititate vessel SOPEP for diesel spills	Immediately on spill detection	Vessel Master	
Verify that relevant notifications have been made (i.e. NOPSEMA, DoT if the potential for a State response).	Within 2 hours of spill detection	Vessel Master	
Tasking checklist VOGA Emergency Management Response – Perth ICT (timeframe is on notification of spill)			
Visual observation from aircraft (in daylight hours only) has been arranged.	Within 2 hours	Logistics Chief Perth ICT	
Convene planning meeting to confirm and document: • Incident response aim • Priorities and objectives • Strategies • Priority resources required to be requested.	Within 3 hours	Planning Chief Perth ICT	
Commission RPS to undertake real-time modelling to determine trajectory and fate of oil.	Within 3 hours	Planning Chief Perth ICT	
Obtain available data re: • Weather • Tides/currents • Topography and shoreline • Environmental sensitivity data • Spill trajectory (observed or by modelling) • Oil data (character and behaviour) • Community issues • Action taken to date.	Within 3 hours	Planning Chief Perth ICT	
Activate operational and scientific monitoring service providers through OSRL call off form.	Within 4 hours	IC in conjunction with Planning Chief and Environment Unit Leader (EUL)	
Complete Preliminary SIMA to identify indicative response options and protection priorities (based on Strategic SIMA).	Within 6 hours	EUL and Planning Chief Perth ICT	
Activate priority resources (labour, equipment, transport and other support) based on outcomes of planning meeting and the initial IAP.	Within 6 hours	Logistics Chief in consultation with Planning Chief Perth ICT	
Identify relevant Tactical Response Plans for protection priorities and request from DoT and Titleholder (based on Preliminary SIMA).	Within 6 hours	EUL and Planning Chief Perth ICT	
Activate Oiled Wildlife Response (OWR) Emergency Response Plans (WAOWRP and POWRP), including: • VOGA Oiled Wildlife Commander (Wildlife Division Coordinator [WDC]).	Within 6 hours	Planning Chief	

OPP 1 DIESEL SPILL – TASK CHECKLIST (first 24 hours)			
	Timeframe	**Who**	**Completed**
Monitor the response by scheduling and undertaking regular briefings/debriefings of ICT using the SMEACS format.	Every 6 hours or as necessary	IC in conjunction with Planning Chief ICT	
Issue regular SITREPS (include DoT if spill has the potential to enter State waters).	Every 6 hours or as necessary	Planning Chief Perth ICT	
Monitor OH&S performance through Section 17 of Part 6.	Ongoing	Safety Officer	
Transition to IAP cycle as per Section 6.	Within 24 hours	IC Perth ICT	
Determine OWR response level as per Section 7.9	Within 12 hours	Planning Chief	
Activate OWR first strike response kits to be delivered to the most appropriate staging areas for POWRP operational sectors 6-14. Locations will be confirmed based on OSTM at the time of the spill and the initial SIMA.	Within 24 hours	Logistics Chief	
Mobilise 2 x OWR containers to be delivered to Dampier.	Within 24 hours	Logistics Chief	
Request aerial, marine and shoreline wildlife surveillance.	Within 24 hours	WDC through Logistics Chief	
Mobilise OWR personnel.	Within 24 hours	WDC through Logistics Chief	

10.2.1 Monitoring and Evaluation Response Plan Strategy

Table 10-3: Monitor and evaluate

Task	Guidance
Visual observation from vessel	
Provide an initial situational awareness to the PIC	To initiate this strategy, the PIC of a vessel where the spill has occurred will (if safe to do so) organise for an observer to monitor the spill and communicate information regarding the appearance of the oil, area covered and if the spill has ceased. This process is depicted in Flowchart 1. Observer on scene to record and report to PIC on vessel (who then provides information to Planning Chief) the following. • Estimate the percentage cover by colour; silver, rainbow, black/dark brown, or brown/orange. • Is there wildlife in or near the spill? • Are there other vessels or activities occurring within or near the spill? • Is it possible to confirm if the spill is continuous?
Ongoing situational awareness	As directed by Planning Chief, provide updates on what the spill looks like, area covered, presence of wildlife or other activities.
Operational and scientific monitoring	
Activate OSRL OSM Supplementary Agreement	Log onto OSRL OSM Document Management Portal and download call off form to activate OSM Service. Utilise OSTM in OPEP and then real time OSTM to identify monitoring locations and OMs and SMs to be activated.

Task	Guidance
Oil spill trajectory modelling	
Activate RPS contract	OSTM is an essential tool used by the Environment Unit in the Planning Team to determine resources at risk and protection priorities. Planning Chief in liaison with Logistics Chief activates the RPS contract for real time trajectory modelling: 1) Complete the modelling request form with as much detail as possible to allow for generation of modelling results and outputs. 2) Call the RPS on 0408 477 196 to advise the RPS Duty Officers that they are now activated and a trajectory modelling request will be sent to them via email. Please note that the call to the RPS Duty Officers must be made as the email account is not monitored 24/7. 3) Send completed request form to RPS Duty Officers via email at rpsresponse@rpsconsulting.com 4) Follow up the email with a phone call to the RPS Duty Officers to confirm email receipt and contents of the email (i.e. the modelling request form) are correct. In the event the email was not received a secondary/backup email address can be used (rpsresponse@rpsconsulting.com). 5) The RPS Duty Officers will undertake the modelling as per the modelling request form provided. Should any of the incident details change, as further information becomes available, please call the RPS Duty Officers to inform them of the change. Follow this call up with an email confirming the change in details for the modelling. 6) Model outputs will be forwarded from the RPS Duty Officers to the requesting client officer as quickly as possible. The results will be transmitted by email to the requesting client officer and copied to the designated parties as identified by the client officer. The results may be passed on via a number of means including email attachment and/or FTP site. 7) Once the modelling results have been received from RPS, call or email the RPS Duty Officer to inform them that the results have been received. 8) If extra advice is sought in regards to interpreting the trajectory modelling output, please follow up with a call to the RPS Duty Officers for further clarification. RPS will require details collected through the situational awareness task such as real time weather, sea state, and oil type spilled.
Manual trajectory model	While waiting for the RPS output use a navigation chart to manually plot the anticipated trajectory of the spill. Trajectory = 3% of the wind vector plus the current vector. Procedure: for each hour add the current velocity vector (in m or km) to 3% of the wind vector.
Aerial observation	
Activate assets to fly as soon as possible in daylight hours only	Upon notification of a spill the Planning Chief requests the Logistics Chief to activate contracts with CHC and Karratha Flying Services. Fixed wing aircraft (preferably over wing configuration) or helicopters to provide personnel with the means to observe and record details of oil on water. Request flight as soon as possible. Pilots or observers be provided with information on the anticipated location of the slick (e.g. from OSTM output). If possible, use aircraft already in the area to provide situational awareness.

Task	Guidance
Secure observers	If trained observers are not available within the timeframe for initial reconnaissance flight, use untrained aerial observers for initial situational awareness. Secure trained aerial observers to quantify amount of oil on water and geographical spread.
Data to be collected – conduct flight as soon as possible in daylight hours only	Aerial observation template forms are to be provided to observers along with a digital camera for video and photos. Observer is to obtain location details (coordinates) from pilot and note these for images and extent of slick. Information is to be provided back to the Planning Chief as soon as possible after the flight has landed. This could be done initially via verbal briefing from the observer and followed up by email or fax of completed observation template.
Ongoing surveillance	Logistics Chief secure appropriate aircraft to undertaken aerial observation activities twice a day – morning and afternoon until advised otherwise by Planning Chief.
Situational awareness	
Collect real-time and predicted data to enter on status boards in ICT; ongoing updates.	Status boards in ICT require the following information (sourced and entered by situation unit leader): • Real-time and predicted weather and sea-state conditions – source from BoM • Real-time and predicted tidal and current movements – source from BoM, websites • Oil characteristics – properties of the oil spilled and predicted behaviour after weathering • Predicted trajectory of oil based on modelling conducted for planning and verified by real time modelling • Resources at risk of being oiled sourced from OPEP • Navigation charts to plot location of vessel.
Incident action planning	At the completion of the monitoring and evaluation tasks, the Planning Chief will review information gathered provide a recommendation to the Incident Commander for future monitoring and evaluation tasks.
Effectiveness guidance for response strategy	Information is available for the ICT: • Quality of information • Consistent reporting • Regular up-to-date information • Methodology and frequency may be altered to increase effectiveness.
Decide on which shorelines will be surveyed for wildlife reconnaissance	SCAT teams led by trained SCAT team leaders from OSRL identify shoreline oiling and provide advice back to the Planning Chief on recommended response strategies as per Operational Monitoring Plan 6 through the OSRL Operational and Scientific Monitoring Supplemental Agreement. Planning Chief is to brief Operations Chief on information that is required to be collected by the SCAT teams which sit within the Shoreline Operations Unit. Operational cleanup teams follow the SCAT teams to implement the recommendations of the SCAT teams (AMOSC, AMSA NRT, WA DoT SRT, OSRL, labour providers). They will require cleanup equipment, waste instructions, logistics and admin support.

Task	Guidance
	Scientific Monitoring teams are deployed to gather pre and post spill environmental data for utilisation in longer term environmental impact studies.
Ongoing shoreline assessment	OMP6 – Shoreline assessment. Shorelines are assessed as to their level of hydrocarbon stranding, and priority for cleanup on a daily basis if possible using the SCAT template. SCAT teams are to be deployed to provide situational awareness back to the Planning Chief via the shoreline oiling templates. Planning to provide the templates to be completed, the segmented shorelines on a map or aerial photo, camera, GPS unit and logbook to SCAT teams. The number of SCAT teams required depends on the size of the affected area and complexity of the habitats to be surveyed. The required turnaround time for the information can also influence the number of SCAT teams deployed. For example, if shoreline response/coordination centre requires data for an area to prepare the assignments for the next day, then all available teams may be deployed to that location. The UK SCAT Manual (Moore, 2004) suggests that for a small-scale operation, where a spill that affects less than 50 km of coast, it could be surveyed in one to two days with one or two teams. A spill in a larger area or one that would require a longer coastal survey probably would involve more field teams and office-based data management support. It is important to remember that some sections of shoreline may need to be resurveyed if oiling conditions change on a daily basis.
Analysis of resources required	For planning purposes in this OPEP, it is assumed that SCAT teams will be made up of three team members and that they can cover approximately 10 km per day (based on similar numbers in The UK Scat Manual; Moore, 2004). This will depend on accessibility and environmental conditions, however, it provides a basis for resource planning. Based on these figures and OSTM outputs, some degree of shoreline survey activity within the first two days. This may be able to be carried out by one to two teams with resurvey on a daily basis if required. SCAT will be led by OSRL and supported by the VOGA ICT. Ground surveys can be guided and supplemented by aerial observation surveys. The cumulative number of teams and personnel required will need scaling according to the complexity and nature of the shoreline oiling. It is difficult to estimate the required resources for this type of response strategy without having real time spill data. For planning purposes, the worst case shoreline oiling results from the OSTM studies have been used to provide some direction as to the maximum resourcing that may potentially be required. Capability determination details are documented in the OSR Capability Review [VOG-7000-RH-0009]. Refine numbers by segment shoreline to work out where to send teams and then work out number of people required. Relies on OSRA and DoT environmental sensitivity data. A specialist Shoreline Division Commander will be used to: • Coordinate basic training to cleanup contractors • Oversee the cleanup process to ensure appropriate procedures are used to minimise the impact on the environment • Provide advice on practical precautions to minimise contact with flora and fauna • Assist with the SIMA process when selecting spill response strategies and to evaluate the impact of strategies • The number of staff and teams required will vary according to the sensitivities being protected.

Table 10-4: Monitor and evaluate minimum resource requirement

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days
Visual observation – from vessel	Identify extent and direction of oil, visual characteristics. Ground truth OSTM.	1 x Observer	Immediate	1 x Observer
Visual observation – from chartered vessels	Identify extent and direction of oil, visual characteristics. Ground truth OSTM.	1 x Vessel 1 x Observer	Mobilise immediately	1 x Vessel 1 x Observer
Visual observation – from aircraft	Identify extent and direction of oil, visual characteristics. Ground truth OSTM.	1 x Observer 1 x Aircraft 1 x Aerial support base	Daylight only, 2 hours	1 x Observer 1 x Aircraft 1 x Aerial support base
Determination of surface and dispersed oil trajectory and fate	Identify the likely trajectory and fate of the spill and dispersed oil, timeframes for the oil (surface or dispersed) to interact with environmental sensitivities.	Contract with technical provider, or in-house provision of OSTM	Requested within 3 hours	Updated OSTM at 48 hours
Shoreline assessment (SCAT teams)	Shorelines are assessed as to their level of hydrocarbon stranding, and priority for cleanup.	3 x SCAT teams	48 hours on site	10 x SCAT teams

10.2.2 Oiled Wildlife Response Strategy

10.2.2.1 Wildlife First Strike Response

Table 10-5: Wildlife first strike response

Task	Guidance
Activate WAOWRP and POWRP	Call the DBCA State Duty Officer on telephone **(08) 9219 9108.** The DBCA State Duty Officer will notify an OWA. Appoint a Wildlife Division Coordinator. First strike response activities may be undertaken within the Environment Unit of the Planning section until a Wildlife Division Coordinator is actually in the ICC.
Rapidly assess the situation	Review OSTM – both the model used in response planning and the real time when available. SITREP – reports of wildlife both oiled and active within the response area.
Provide advice to the IMT in relation to the wildlife assets at risk	Wildlife Division Coordinator to undertake. Use POWRP to identify wildlife assets at risk, cross reference with wildlife information contained in SIMA.
Determine the response level	Refer to the WAOWRP and liaise with DBCA to determine response level
Liaise with Oiled Wildlife Advisor	Wildlife Division Coordinator to liaise with OWA.
Gather information from POWRP	Wildlife specific for POWRP operational sectors 7–12 initially then most appropriate operational sectors between days 10 and 20.
Activate first strike response kits	Wildlife Division Coordinator and OWA discuss get approval from IC.

Task	Guidance
	First strike kits are portable and contain equipment to allow stabilisation of wildlife before triage and possible treatment at an oiled wildlife facility. Refer to Table 3 of the POWRP for kit location and access details.

10.2.2.2 Mobilisation of Resources

Table 10-6: Mobilisation of resources

Task	Guidance
Personnel	Activate and mobilise a Wildlife Operations Coordinator to Dampier.
	Activate the AMOSC OWR Industry Team.
	DBCA volunteer database – access through DBCA Duty Officer.
	Labour hire – source personnel with the following skill-sets/abilities: • Work away from home • Work with animals • Work in remote locations • Medically fit. Source unskilled personnel (OWR skill level 1), mobilise to Dampier and conduct induction process and basic training developed by DBCA.
Equipment	Containers for OWR facilities –Dampier to be set up first to service POWRP operational sectors 7 to 12. Planning to be undertaken for staging sites in various locations in addition to holding centres and/or oiled wildlife facilities (small, medium or large) for Exmouth, Onslow or Port Hedland between days 10 and 20. To be confirmed by OSTM and the SIMA process at the time of the spill.
	Support mobilisation of first strike response kits to priority shoreline staging areas – see Table 7-7.

10.2.2.3 Wildlife Reconnaissance

Table 10-7: Wildlife reconnaissance

Task	Guidance
Aerial reconnaissance	• Aerial reconnaissance will be highly beneficial to identify concentrations of wildlife that can then be targeted by foot or boat. • Where possible, combine the aerial surveillance activities undertaken in monitor and evaluate to gain situational awareness of wildlife that has been oiled or is likely to be oiled. • Need to emphasise data flows – make sure the information gathered is shared within the ICT for the IAP and OSMP activities. • Oiled wildlife specific reconnaissance of known habitats and of shoreline that is predicted to be impacted to identify potential for pre-emptive action.
Marine reconnaissance	• Vessel based reconnaissance will be required for islands and mangroves in POWRP operational sectors 6 to 14.
Shoreline reconnaissance	• For stretches of sandy beach, reconnaissance can be conducted by all-terrain vehicle or four-wheel drive. In areas where beach access is not possible via vehicle (i.e. cliffs), reconnaissance by foot will be required. • All coastal access by vehicles on Barrow Island is forbidden unless approval is granted by DBCA.

Task	Guidance
	• See notes regarding access of personnel to Barrow Island – quarantine and induction requirements.

Table 10-8: OPP OWR minimum resources

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days
Wildlife first strike response	WAOWRP and the POWRP are activated.	N/A – activation task only	Once OPP is activated.	N/A – activation task only
	OWA and Wildlife Division Coordinator are activated and assigned to the ICT.	1 x OWA. 1 x OWR Division Coordinator.	Once WAOWRP is activated.	N/A – activation task only
Mobilisation of resources	First strike response kits are mobilised to staging areas within the POWRP operational sectors 7 to 12.	Vehicles/small trucks to deliver 6 x first strike response kits to operational sectors. Vessels/aircraft to take kits to islands. 1 x OWA. 1 x OWR Division Coordinator.	Within 24 hours.	Mobilisation for Dampier. 1 x OWA. 1 x OWR Division Coordinator.
	Two OWR containers are mobilised to an OWR facility location in Dampier.	2 x OWR containers from Dampier (AMSA) and Fremantle (AMOSC).	Within 24 hours.	2 x OWR containers deployed to Dampier OWR facility.
Wildlife reconnaissance across POWRP operational sectors 7 to 12	Information contained in POWRP and SIMA is ground truthed. Situational awareness regarding wildlife that has been oiled and wildlife present within the path of the spill trajectory is gained.	1 x aerial observation over extent of spill combined with Monitor and Evaluate tasks. 1 x aerial observation over extent of predicted trajectory requires 1 x aircraft. Aerial survey: 1 x observer; 1 x aircraft; 1 x aerial support base for the task. Utilise aerial spill surveillance aircraft and personnel if none available specifically for oiled wildlife reconnaissance.	Concurrently with monitor and evaluate activities. Wildlife-specific reconnaissance within 24 hours.	Aerial survey: 2 x observer; 1 x aircraft (fixed wing or helicopter); 1 x aerial support base for task. Boat based survey: 1 x small vessel (<12 m length) 1 x boat driver; 2 x crew. Shoreline survey: 2 x Quad motorbike or 4WD vehicle; 4 x survey crew. 8 x additional team members.
IAP wildlife sub-plan development	Future OWR activities arrangement developed based on the spill scenario.	1 x OWR Advisor; 1 x OWR Planning officer; 1 x OWR Division Coordinator.	Within 48 hours.	12 x personnel.

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days
Wildlife rescue and staging	OWR rescue operations should determine the best combination of pre-emptive capture, hazing and the collection and management of oiled wildlife based on resources available. Begin establishing staging site as a logistic base for search and capture teams. Staging areas to be set up in POWRP operational sectors 7 to 12. Then in most appropriate operational sectors as per the OSTM and SIMA analsyis.	Boat based collection/hazing: 1 x small vessel (<12m length); 1 x boat driver; 2 x crew; 2 x capture nets; 10 x cages (depending on vessel deck space and type of oiled wildlife encountered – seabirds are most likely in this timeframe).	Within 72 hours.	Boat based collection/hazing: 1 x vessel (<12 m length); 1 x boat driver; 4 x crew; 4 x capture nets; 50 x cages. Staging site: 1 x OWR kits (AMSA/ AMOSC). 25 x personnel.
Establishment of an oiled wildlife facility	Establish and manage OWR facility in Dampier, Montebello Islands and/or Barrow Island	1 x suitable area for facility pre-identified/ analysed for suitability, i.e. Dampier Sharks Football Club (Pilbara OWRP) or Windy Ridge Oval and Facilities; 2 x OWR containers; existing built facilities or temporarily erected/ installed structures, i.e. marquees (at least 4 m x 4 m), mobile site offices; shower and toilet facilities; laundry facilities or contactor to outsource laundering; resources and equipment as listed in the WAOWRP.	Within 3–4 days for Dampier.	Mobilise resources for oiled wildlife facility. 18 x personnel.

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days
Wildlife rehabilitation	OWA and OWR Planning officer to gather information on the spill to gauge potential wildlife impacts and therefore long-term rehabilitation requirements. Incorporates OSMP scientific monitoring tasks specific to oiled wildlife.	1 x OWR Planning officer; 1 x OWR Division Coordinator. Activation of OSMP oiled wildlife contractor.	By day 5.	1 x OWR Planning officer; 1 x OWR Division Coordinator. 56 x personnel. Maintenance of OSMP oiled wildlife contractor.
Oiled wildlife termination	Oiled wildlife rescue and rehabilitation of animals is completed. Establish a demobilisation team to ensure all records are forwarded to the logistics section for processing, all facilities are decontaminated, stocks replenished, all waste is removed and all wildlife still in care is transferred to a suitable wildlife rehabilitation facility, i.e. Perth Zoo.	N/A	By day 10.	N/A

Section 11 – Oil Pollution Plan 2 (Loss of Well Control)

11.1 Instructions

- Complete the initial actions and notifications in Part 4 for activating the OPEP.
- Work through the initial incident action plan Table 11-1.
- Check off tasks that have been undertaken using Table 11-2.
- Generate a SIMA utilising the VOGA oil response tools.
- Check which OSMPs are required to be activated.
- Transition into incident IAP process.

11.2 Initial Incident Action Plan

Table 11-1: OPP2 Wandoo Crude loss of well control initial IAP

Incident Action Plan objectives:	Ascertain extent of spill
	Prevent impact to sensitive resources
Protection priorities	**Oil spill response strategies** (Means of accomplishing objectives)
The focus for VOGA pre-planning of response activities for first strike response and initial resource mobilisation is the Pilbara coast and offshore islands between Ashburton River Mouth and De Grey River Mouth. This area is the most likely to be impacted first, most significantly and contains several sensitive locations. Dampier is the site most likely to be required for a forward base. For indicative planning, OSTM analysis indicates that several sensitive locations along the coast from North West Cape to Broome may be impacted to varying levels and require a response between Days 9 and 20. Priorities will be verified in a response with real time trajectory data and analysis of seasonal vulnerabilities through the SIMA process.	1. Monitor and evaluate
	2. Chemical dispersion
	3. Mechanical dispersion
	4. Containment and recovery
	5. Protection and deflection
	6. Shoreline clean-up.
	7. Wildlife Response

Strategies	Tactics (What is planned to be done?)	Tasks
Monitor and evaluate	Visual observation from vessel	Provide initial situational awareness to the PIC
		Ongoing situational awareness
	Deploy satellite tracking buoy	Deploy unit – PIC
		Access real-time data
		Interpret data
	Oil spill trajectory modelling	Activate RPS modelling contract
		Manual trajectory model
	Aerial observation	Activate assets to fly as soon as possible in daylight hours only
		Secure observers
		Data to be collected – conduct flight as soon as possible in daylight hours only
		Ongoing surveillance
	Situational awareness	Collect real-time and predicted data to enter on status boards in ICT
		Obtain satellite imagery
		Preliminary SIMA and incident action planning for guidance on response strategies and protection prioririte s.
		Effectiveness guidance for response strategy
	Shoreline Assessment OM6	Activate OSRL and provide analysis of trajectory modelling
		Analysis of aerial observation and current situational awareness
		Consider constraints
		Decide on which shorelines will be surveyed
		Analysis of resources and logistics required
Chemical dispersion	Aerial dispersant operations	Activate oil spill monitoring arrangements through the OSM-BIP
		Activate aircraft and mobilise dispersant to Karratha Airport within 6 hours of the spill
		Set up operating post at Karratha Airport
		Monitoring dispersant effectiveness of test spray runs using visual observation (refer to OMP4a)
		Arrange for a spotter plane to accompany air tractor
		Arrange for trained Aerial Attack Coordinator (AAC) to be available for test spray run
		Pre-flight briefing
		Test spray run by air tractor
		Monitoring dispersant effectiveness of test spray runs using visual observation (refer to OMP4a)
		Planning Chief to undertake a SIMA of chemical dispersion operations – operational activities

Strategies	Tactics (What is planned to be done?)	Tasks
		Secure trained personnel to run dispersant operation
		Pre-flight briefing
		Ongoing dispersant operations
		Volume of dispersant and number of aircraft required
		Monitoring dispersant effectiveness – ongoing operations (refer to OMP4a)
		Debriefing
		Stockpile management
		Incident action planning
		Effectiveness guidance for response strategy
	Marine dispersant operations	Identify marine operating base
		Source vessel
		Dispersant stocks
		Dispersant spray system
		Arrange for a spotter plane to accompany marine vessel
		Planning Chief to undertake a SIMA of chemical dispersion operations – test run activities
		Test run by marine vessel
		Monitoring dispersant effectiveness (refer to OMP4a)
		Planning Chief to undertake a SIMA of chemical dispersion operations – operational activities
		Ongoing dispersant operations
		Debriefing
		Stockpile management
		Incident action planning
		Effectiveness guidance for response strategy
Mechanical dispersion	Mechanical dispersion operations	Planning Chief to undertake a SIMA of mechanical dispersion operations
		Secure offshore work vessel
		Secure spotter aircraft
		Deploy vessels
		Incident action planning
		Effectiveness guidance for response strategy
Containment and recovery	Offshore and near shore containment and recovery	Planning Chief to undertake a SIMA of containment and recovery operations
		Do weather conditions and sea state permit safe and effective deployment of booms and skimmers?
		Does containment and recovery appear feasible?
		If the decision is made in the ICT to proceed with containment and recovery (based on Planning Chief's recommendation) the following tasks are to be completed.

Strategies	Tactics (What is planned to be done?)	Tasks
		Mobilise vessels suitable for either offshore or near shore operations
		Mobilise booms and skimmers
		Mobilise trained equipment operators
		Spotter plane to direct operations
		Establish a forward operating base for temporary storage of equipment and waste
		Deploy booms, skimmers and temporary waste storage
		Develop waste storage and transport plan
		Incident action planning
		Effectiveness guidance for response strategy
Protection and deflection	Near shore protection and deflection operations	Analysis of trajectory modelling (refer to OMP1) and baseline monitoring data
		Analysis of aerial observation and current situational awareness (refer to OMP1)
		Understanding of real time currents and tides
		Planning Chief undertakes a SIMA for protection and deflection operations
		Determine and source resources required and booming configuration (identify and access relevant Tactical Response Plans for guidance)
		Induction
		Marine vessel transport of people and equipment
		Aerial surveillance and/or transport
		Consider constraints
		Incident action planning
		Effectiveness guidance for response strategy
Shoreline cleanup	Shoreline cleanup operations	Analysis of trajectory modelling (refer to OMP1)
		Analysis of aerial observation and current situational awareness (refer to OMP1)
		Planning Chief undertakes a SIMA for shoreline cleanup operations
		Consider constraints
		Decide on which shorelines will be cleaned and monitored based on SCAT
		Analysis of resources required
		Logistics
		Induction
		Marine vessel transport of people and equipment
		Aerial surveillance and/or transport
		Equipment
		Ongoing shoreline assessment

Strategies	Tactics (What is planned to be done?)	Tasks
		Ongoing cleanup operations
		Waste collection and transport
		Incident action planning
		Effectiveness guidance for response strategy
Oiled wildlife response	Wildlife first strike response	Activate WAOWRP and POWRP
		Rapidly assess the situation
		Provide advice to the ICT in relation to the wildlife assets at risk
		Determine the response level
		Liaise with Oiled Wildlife Advisor
		Gather information from POWRP
		Activate first strike response kits
	Mobilisation of wildlife resources	Personnel
		Equipment
	Wildlife reconnaissance.	Aerial reconnaissance
		Marine reconnaissance
		Shoreline reconnaissance

Table 11-2: Task checklist for loss of well control Wandoo crude

OPP 2 WANDOO CRUDE SPILL – TASK CHECKLIST (first 24 hours)			
	Timeframe	**Who**	**Completed**
Tasking checklist facility/on site			
Start and maintain personal log.	Immediately on spill detection	Vessel Master/ PIC MODU	
Undertake visual observation from off-take vessel, platform and/or vessels of opportunity immediately.	Immediately on spill detection	Observer on site	
Activate and deploy satellite tracking buoy.	Within 30 minutes of spill detection	PIC MODU	
Verify that relevant notifications have been made (i.e. NOPSEMA, DoT if the potential for a State response).	Within 2 hours of spill detection	PIC MODU	
Tasking checklist VOGA Emergency Management Response – Perth ICT (Timeframe is on notification of spill)			
Satellite imagery of the spill to be initiated.	Within 2 hours of a spill	Planning Chief Perth ICT	
Visual observation from aircraft (in daylight hours only) has been arranged.	Within 2 hours	Logistics Chief Perth ICT	
Convene planning meeting to confirm and document: • Incident response aim • Priorities and objectives • Strategies • Priority resources required to be requested.	Within 3 hours	Planning Chief Perth ICT	

OPP 2 WANDOO CRUDE SPILL – TASK CHECKLIST (first 24 hours)			
	Timeframe	**Who**	**Completed**
Commission RPS to undertake real-time modelling to determine trajectory and fate of oil.	Within 3 hours	Planning Chief Perth ICT	
Obtain available data re: • Weather • Tides/currents • Topography and shoreline • Environmental sensitivity data • Spill trajectory (observed or by modelling) • Oil data (character and behaviour) • Community issues • Action taken to date.	Within 3 hours	Planning Chief Perth ICT	
Activate operational and scientific monitoring service providers through the OSRL oil spill monitoring call off form.	Within 4 hours	IC in conjunction with Planning Chief ICT and Environment Unit Leader (EUL)	
Complete Preliminary SIMA to identify indicative response options and protection priorities (based on Strategic SIMA).	Within 6 hours	EUL and Planning Chief Perth ICT	
Activate vessel-based dispersant operations to conduct test spray run and ongoing dispersant operations	Within 6 hours	IC in consultation with Planning Chief Perth ICT	
Activate FWADC via AMSA to conduct test spray run.	Within 6 hours	IC in consultation with Planning Chief Perth ICT	
Mobilise dispersant.	Within six hours	Logistics Chief in consultation with Planning Chief Perth ICT	
Undertake operational SIMA to determine if dispersant strategy will be implemented.	Within 2 hours of completion of test run	EUL and Planning Chief Perth ICT	
Activate priority resources (labour, equipment, transport and other support) based on outcomes of planning meeting and the initial IAP.	Within 6 hours	Logistics Chief in consultation with Planning Chief Perth ICT	
Identify relevant Tactical Response Plans for protection priorities and request from DoT and Titleholder (based on Preliminary SIMA)	Within 6 hours	EUL and Planning Chief Perth ICT	
Activate Oiled Wildlife Response (OWR) Emergency Response Plans (WAOWRP and POWRP) including: • VOGA Oiled Wildlife Commander (Wildlife Division Coordinator [WDC])	Within 6 hours	Planning Chief	

OPP 2 WANDOO CRUDE SPILL – TASK CHECKLIST (first 24 hours)			
	Timeframe	**Who**	**Completed**
Monitor the response by scheduling and undertaking regular briefings/debriefings of ICT using the SMEACS format.	Every 6 hours or as necessary	IC in conjunction with Planning Chief ICT	
Issue regular SITREPS (include DoT if spill has the potential to enter State waters).	Every 6 hours or as necessary	Planning Chief Perth ICT	
Monitor waste volumes and management as per Section 5. If necessary arrange for the development of a Waste Management Plan.	Ongoing	Planning and Operations Chiefs Perth ICT	
Monitor OH&S performance through Section 17 of Part 6.	Ongoing	Safety Officer	
Transition to IAP cycle as per Section 6.	Within 24 hours	IC Perth ICT	
Determine OWR response level	Within 12 hours	Planning Chief	
Activate OWR first strike response kits to be delivered to the most appropriate staging areas for POWRP operational sectors 6 to 14. Locations will be confirmed based on OSTM at the time of the spill and the initial SIMA.	Within 24 hours	Logistics Chief	
Mobilise 2 x OWR containers to be delivered to Dampier	Within 24 hours	Logistics Chief	
Request aerial, marine and shoreline wildife surveillance	Within 24 hours	WDC through Logistics Chief	
Mobilise OWR personnel	Within 24 hours	WDC through Logistics Chief	

11.2.1 Monitoring and Evaluation Response Plan Strategy

Table 11-3: Monitor and evaluate

Task	Guidance
Visual observation from vessel or facility	
Provide an initial situational awareness to the PIC	To initiate this strategy, the PIC of a vessel or the Wandoo Facility where the spill has occurred will (if safe to do so) organises for an observer to monitor the spill and communicate information regarding the appearance of the oil, area covered and if the spill has ceased. This process is depicted in Flowchart 1. Observer on scene to record and report to PIC on facility or vessel (who then provides information to Planning Chief) the following: Estimate the percentage cover by colour; silver, rainbow, black/dark brown, or brown/orange. Is there wildlife in or near the spill? Are there other vessels or activities occurring within or near the spill? Is it possible to confirm if the spill is continuous?
Ongoing situational awareness	As directed by Planning Chief, provide updates on what the spill looks like, area covered, presence of wildlife or other activities.

Task	Guidance
Deploy satellite tracking buoy	
Deploy unit – PIC	It is important to deploy a satellite tracking buoy from the Facility as soon as possible after the spill has occurred, so that real-time data can be collected to verify pre-spill trajectory modelling and also be inputted into real-time modelling. PIC on Wandoo B (or delegate) deploys tracking buoy by removing from storage on Wandoo B, turning it on and releasing as close to the spill as possible.Planning Chief to check that this has been done. Additional units deployed every 3 days.
Access real-time data	Planning Chief accesses data from: …….. Access details: Username: …….. Password: ……
Interpret data	Planning Chief uses real-time data and knowledge of sensitivities to estimate spill trajectory and resources that could be impacted. Real time data is also provided to RPS to validate OSTM.
Oil spill trajectory modelling	
Activate RPS contract	OSTM is an essential tool used by the Environment Unit in the Planning Team to determine resources at risk and protection priorities. Planning Chief in liaison with Logistics Chief activates the RPS contract for real time trajectory modelling: Complete the modelling request form with as much detail as possible to allow for generation of modelling results and outputs. Call the RPS on 0408 477 196 to advise the RPS Duty Officers that they are now activated and a trajectory modelling request will be sent to them via email. Please note that the call to the RPS Duty Officers must be made as the email account is not monitored 24/7. Send completed request form to RPS Duty Officers via email at rpsresponse@rpsconsulting.com Follow up the email with a phone call to the RPS Duty Officers to confirm email receipt and contents of the email (i.e. the modelling request form) are correct. In the event the email was not received, a secondary/backup email address can be used (rpsresponse@rpsconsulting). The RPS Duty Officers will undertake the modelling as per the modelling request form provided. Should any of the incident details change, as further information becomes available, please call the RPS Duty Officers to inform them of the change. Follow this call up with an email confirming the change in details for the modelling. Model outputs will be forwarded from the RPS Duty Officers to the requesting client officer as quickly as possible. The results will be transmitted by email to the requesting client officer and copied to the designated parties as identified by the client officer. The results may be passed on via a number of means including email attachment and/or FTP site. Once the modelling results have been received from RPS, call or email the RPS Duty Officer to inform them that the results have been received. If extra advice is sought in regards to interpreting the trajectory modelling output, please follow up with a call to the RPS Duty Officers for further clarification. RPS will require details collected through the situational awareness task such as real time weather, sea state, and oil type spilled.
Manual trajectory model	While waiting for the RPS output use a navigation chart to manually plot the anticipated trajectory of the spill. Trajectory = 3% of the wind vector plus the current vector.

Task	Guidance
	Procedure: for each hour, add the current velocity vector (in m or km) to 3% of the wind vector.
Aerial observation	
Activate assets to fly as soon as possible in daylight hours only	Upon notification of a spill the Planning Chief requests the Logistics Chief to activate contracts with CHC and Karratha Flying Services. Fixed wing aircraft (preferably over wing configuration) or helicopters to provide personnel with the means to observe and record details of oil on water. Request flight as soon as possible. Pilots or observers be provided with information on the anticipated location of the slick (e.g. from OSTM output). If possible use aircraft already in the area to provide situational awareness. Flight time to the Wandoo B platform is 20 minutes (48 nm) based on S76 helicopter (@140 knots).
Secure observers	If trained observers are not available within the timeframe for initial reconnaissance flight use untrained aerial observers for initial situational awareness. Secure trained aerial observers to quantify amount of oil on water and geographical spread.
Data to be collected – conduct flight as soon as possible in daylight hours only	Aerial observation template forms are to be provided to observers along with a digital camera for video and photos. Observer is to obtain location details (coordinates) from pilot and note these for images and extent of slick. Information is to be provided back to the Planning Chief as soon as possible after the flight has landed. This could be done initially via verbal briefing from the observer and followed up by email or fax of completed observation template.
Ongoing surveillance	Logistics Chief secure appropriate aircraft to undertaken aerial observation activities twice a day – morning and afternoon until advised otherwise by Planning Chief.
Situational awareness	
Collect real-time and predicted data to enter on status boards in ICT. Ongoing updates	Status boards in ICT require the following information (sourced and entered by situation unit leader): Real-time and predicted weather and sea-state conditions – source from BoM Real-time and predicted tidal and current movements – source from BoM, websites Oil characteristics – properties of the oil spilled and predicted behaviour after weathering Predicted trajectory of oil based on modelling conducted for planning and verified by real time modelling Resources at risk of being oiled sourced from OPEP Navigation charts to plot location of vessel/MODU/facility.
Obtain satellite imagery	Satellite imagery may be used to assist in ascertaining the extent of the spill. This imagery will be used within the Planning Section to assist in determining resources at risk and protection priorities. High fidelity photographs using different spectrums to identify the trajectory of the oil, ground truth the OSTM, sourced from Landgate or via OSRL. Time to acquire images depends on availability of satellites over the spill site. Landgate to be activated by the VOGA User Representative Contacts (URCs) only.
Incident action planning	At the completion of the monitoring and evaluation tasks, the Planning Chief will review information gathered provide a recommendation to the Incident Commander for future monitoring and evaluation tasks.

Task	Guidance
Effectiveness guidance for response strategy	Information is available for the ICT: • Quality of information • Consistent reporting • Regular up-to-date information • Methodology (satellite tracking buoy, visual observation) and frequency may be altered to increase effectiveness.
Decide on which shorelines will be surveyed	Utilise the OSTM outputs in Section 4 to guide initial decision making on shorelines to be surveyed and cross check this with the real time OSTM sourced based on the actual spill scenario. Provide this information to the SCAT teams led by trained SCAT team leaders from OSRL, AMOSC, DoT and AMSA to identify shoreline oiling and provide advice back to the Planning Chief on recommended response strategies. OSRL will lead SCAT activities as per the Oil Spill Monitoring Bridging Implementation Plan. Planning Chief is to brief Operations Chief on information that is required to be collected by the SCAT teams which sit within the Shoreline Operations Unit. Operational cleanup teams follow the SCAT teams to implement the recommendations of the SCAT teams (AMOSC, AMSA NRT, WA DoT SRT, OSRL, labour providers). They will require cleanup equipment, waste instructions, logistics and admin support. Scientific Monitoring teams are deployed to gather pre and post spill environmental data for utilisation in longer term environmental impact studies. This is led by OSRL upon action of the Oil Spill Monitoring Bridging Implementation Plan.
Ongoing shoreline assessment	OMP6 – Shoreline assessment led by OSRL. Shorelines are assessed as to their level of hydrocarbon stranding, and priority for clean-up on a daily basis if possible using the SCAT template. SCAT teams are to be deployed to provide situational awareness back to the Planning Chief via the shoreline oiling templates. Planning to provide the templates to be completed, the segmented shorelines on a map or aerial photo, camera, GPS unit and logbook to SCAT teams. The number of SCAT teams required depends on the size of the affected area and complexity of the habitats to be surveyed. The required turn-around time for the information can also influence the number of SCAT teams deployed. For example, if shoreline response/coordination centre requires data for an area to prepare the assignments for the next day, then all available teams may be deployed to that location. The UK SCAT Manual (Moore, 2004) suggests that for a small-scale operation, where a spill that affects less than 50 km of coast, it could be surveyed in one to two days with one or two teams. A spill in a larger area or one that would require a longer coastal survey probably would involve more field teams and office-based data management support. It is important to remember that some sections of shoreline may need to be resurveyed if oiling conditions change on a daily basis.
Analysis of resources required	For planning purposes in this OPEP, it is assumed that SCAT teams will be made up of three team members and that they can cover approximately 10 km per day (based on similar numbers in The UK Scat Manual; Moore, 2004). This will depend on accessibility and environmental conditions, however, it provides a basis for resource planning. Based on these figures and OSTM outputs, all spill categories will require some degree of shoreline survey activity within the first four days. This may be able to be carried out by one to two teams with resurvey on a daily basis if required. Ground surveys can be guided and supplemented by aerial observation surveys. The cumulative number of teams and personnel required will need scaling according to the complexity and nature of the shoreline oiling. It is difficult to estimate the required resources for this type of response strategy without having real time spill data.

Task	Guidance
	For planning purposes, the worst case shoreline oiling results from the OSTM studies have been used to provide some direction as to the maximum resourcing that may potentially be required. Capability determination details are documented in the OSR Capability Review [VOG-7000-RH-0009]. Refine numbers by segment shoreline to work out where to send teams and then work out number of people required. Relies on OSRA and DoT environmental sensitivity data. A specialist Shoreline Division Commander will be used to: • Coordinate basic training to cleanup contractors • Oversee the cleanup process to ensure appropriate procedures are used to minimise the impact on the environment • Provide advice on practical precautions to minimise contact with flora and fauna • Assist with the SIMA process when selecting spill response strategies and to evaluate the impact of strategies • The number of staff and teams required will vary according to the sensitivities being protected.

Table 11-4: Monitor and evaluate minimum resource requirements

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Visual observation – from platform	Identify extent and direction of oil, visual characteristics. Ground truth OSTM.	1 x Observer.	Immediate	1 x Observer.	1 x Observer (Category E and F).	2 x Observers.
Visual observation – from chartered vessels	Identify extent and direction of oil, visual characteristics. Ground truth OSTM.	1 x Vessel. 1 x Observer.	Mobilise immediately	1 x Vessel. 1 x Observer.	1 x Vessel. 1 x Observer.	1 x Vessel. 1 x Observer.
Visual observation – from aircraft	Identify extent and direction of oil, visual characteristics. Ground truth OSTM.	1 x On-site Incident Commander with oil spill assessment training.	Daylight only, 2 hours	1 x Observer. 1 x Aircraft. 1 x Aerial support base.	1 x Observer. 1 x Aircraft. 1 x Aerial support base.	2 x Observers. 1 x Aircraft. 1 x Aerial support base.
Determination of surface and dispersed oil trajectory and fate	Identify the likely trajectory and fate of the spill and dispersed oil, timeframes for the oil (surface or dispersed) to interact with environmental sensitivities.	OSTM requested through RPS.	Requested within 3 hours	1 x On-site Incident Commander with oil spill assessment training. OSTM requested through RPS	1 x On-site Incident Commander with oil spill assessment training. OSTM requested through RPS	2 x On-site Incident Commanders with oil spill assessment training. OSTM requested through RPS

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Satellite imagery	High fidelity photographs using different spectrums to identify the trajectory of the oil, ground truth the OSTM.	Contract with technical provider or access to AMSA technical provider.	Requested within 2 hours	Contract with technical provider or access to AMSA technical provider.	Contract with technical provider or access to AMSA technical provider.	Contract with technical provider or access to AMSA technical provider.
Satellite tracking buoys	Identification of the leading edge/rear edge of the spill.	At least two operational on the facility or vessels within the field. Data site 'back end' to GIS system. Current contract with satellite provider.	Deployed within 30 minutes	At least 4 operational on vessels within the field Data site 'back end' to GIS system. Current contract with satellite provider.	At least 6 operational on vessels within the field. Data site 'back end' to GIS system. Current contract with satellite provider.	At least 8 operational on vessels within the field. Data site 'back end' to GIS system. Current contract with satellite provider.
Shoreline assessment (SCAT teams)	Shorelines are assessed as to their level of hydrocarbon stranding, and priority for cleanup.	18 x OSRL SCAT specialists plus additional team members trained in week 1 via SCAT E-learning training course.	72 hours on site	10 teams of 3 people	10–30 teams of 3 people each	45 teams (of 2 people per team)

11.2.2 Chemical Dispersant Application

11.2.2.1 Aerial Dispersant Operations

Table 11-5: Aerial dispersant application

Task	Guidance
Activate aircraft within 6 hours of the spill	Planning Chief to advise Logistics Chief to advise AMOSC to activate FWADC by calling AMSA RCC on **1800 641 792**. Request four air tractors Mobilise to Karratha Airport. The ICT will consider mobilising the OSRL aircraft to support air tractor operations once situational awareness has been obtained. If it is activated, it will fly into Port Hedland for immigration and customs clearance before proceeding to Karratha to take part in dispersant application operations. The OSRL aircraft will be able to deliver half of the daily dispersant application required in five spray runs, complemented by the activities of four air tractors completing five sorties each. Complete the AMSA/AMOSC Joint Standard Operating Procedure document – the FWADC aircraft won't be tasked for operations until this document is completed.

Task	Guidance
Mobilise dispersant to Karratha Airport within 6 hours of the spill	Planning Chief to confirm with Logistics Chief the volume of dispersant to be mobilised to Karratha Airport. Mobilise an initial minimum of 90 m^3 from available stockpiles to allow provide for at least 2 days dispersant application at a daily rate of 38 m^3 per day. Mobilise a dispersant transfer pump to be able to transfer dispersant from IBCs to aircraft.
Set up operating post at Karratha Airport	Logistics Chief to liaise with Karratha Airport to set up a staging area for dispersant stockpile and transferring dispersant to aircraft. Managed by the Aerotech Liaison Officer (provided by the FWADC contractor).
Complete SIMA to justify test run	Planning Chief completes SIMA pro-forma with what is known about the spill at the time to record justification for testing dispersant. See Appendix E.
Arrange for a spotter plane to accompany air tractor	Logistics Chief to secure a helicopter to or alternative aircraft to provide aerial dispersant spotter duties. Aircraft will be required to fly above the air tractor and advise pilot when to turn spray on and off. Requires communication plan between the two aircraft. Depending on the scale of the application area, additional spotter aircraft may be required to direct air tractors operating in separate areas. If one area of the slick is being treated by the four air tractors, then one spotter helicopter or plane will be used to direct spraying activities.
Arrange for trained AAC to be available for test spray run	AAC to communicate with pilot of air tractor to direct spray operations over the oil slick and to complete the Aerial Dispersant Monitoring Log (OSRL Handbook). Will need AACs for each area of operation if more than one spotter plane is being used.
Pre-flight briefing	Flight planning forms and manifests to be lodged prior to sorties departure. Communications will be agreed upon during the pre-operational briefings taking into account all aircraft utilised onsite at time for operations. This is most likely to comprise: • Two aircraft VHF channels air to air with local Airfield CTAF also used/monitored • Aircraft also have to have Marine Radios which can also be utilised.
Test spray run by air tractor	Loading and fuelling of the aircraft will be under the supervision of the Loading Supervisor, and to the satisfaction of the pilot. Dispersant application rate is to be set at 50 litres per hectare with a swath width of 22 m [dependent on Aircraft]. The spray area will be determined by the movement of oil and as directed by the AAC in [insert spotter platform call sign]. When tasked, the spotter platform with AAC [insert helicopter or plane call sign, most likely to be CHC] will proceed to the target area and identify the target site. It will then call in [insert aircraft call sign(s) or aircraft type/Operator] and direct the dispersant attack. Dispersant will be applied within the dispersant application zone (Section 7.4.2.1) Seasonal environmental conditions and sensitivities will dictate spray runs and areas. An analysis to determine these specific sectors will be undertaken at the time by the Planning Chief and implemented by the Aviation and Marine Units in Operations. Test application runs of approximately 100m in length will be made and several passes may be required to determine dispersant effectiveness. The AAC will direct the air tractor to make another pass if required. The AAC will observe the effectiveness of the dispersant on the oil slick and will report if dispersant is having a mixing effect on the oil and complete the Dispersant Monitoring Application Log (OSRL Handbook). Photographs will be taken by the AAC to provide to the Planning Chief and Environment Unit. The pilot of the air tractor will complete a Dispersant Application Log and provide this to the Operations Chief upon completion of the mission. The Operations Chief provides this detail to the Planning Chief.

Task	Guidance
	VFR shall be observed at all times, along with standard radio protocols and monitoring. Pilots will maintain separation.
Monitoring dispersant effectiveness (OMP4a)	The spray run may be run several times to determine the most appropriate dispersant to oil ratio. Full dispersant operations will commence once this test run has been reported achieving some dispersion, which will be determined visually by monitoring service providers during (refer to OSM BIP [WAN-2000-RD-0001.04]) the test run in the field. It is extremely difficult to quantify the percentage of oil dispersed so visual observation of effectiveness will assess if the dispersant is having a positive effective of dispersing oil into the water column or if it is not working as intended. The AAC will brief the Operations Chief of the dispersant operations and observed effectiveness based on the Aerial Dispersant Monitoring Log and observations made of dispersant and oil mixing within the water column and the resultant colour of the oil mix. Use the OSRL Dispersant Application Monitoring Handbook to determine visually if the dispersant is having an effect. Visual indications that dispersant is effective: • Yellow/coffee/grey colour plume present in the water (the exact colour will vary with the original colour of the oil). • Oil spill surface area reduced. • Oil rapidly disappearing from surface. • Oil in some areas being dispersed to leave only sheen on the surface. This colour change may not been seen immediately; time should be given to permit the dispersion process to take place. This is particularly important for more viscous oils. A milky white plume indicates dispersant is ineffective and will be present if: • Too much dispersant is applied (overdosing) • There is poor targeting of spill area • If the spilt oil is heavy or emulsified the dispersant may not penetrate the oil, running off into un oiled water • Dispersant is washed off the black oil as white, watery solution leaving oil on the surface • Quantity of oil on the sea surface is not altered by dispersant.
Complete SIMA to justify ongoing dispersant use	Planning Chief completes SIMA pro-forma with what is known about the spill at the time to record justification for ongoing dispersant use based on the results of the test runs.
Secure trained personnel to run dispersant operation	Dispersant application equipment and trained personnel are available from the AMOSC stockpile and Core Group; the AMSA National Plan stockpiles and NRT and the OSRL stockpiles and responders. Resourcing requirements for this strategy are outlined in VOGA Emergency Response Logistics Management Plan [VOG-7000-RH-0008] .
Pre-flight briefing	Flight planning forms and manifests to be lodged prior to sorties departure. Communications will be agreed upon during the pre-operational briefings taking into account all aircraft utilised onsite at time for operations. This is most likely to comprise: • Two aircraft VHF channels air to air with local Airfield CTAF also used/monitored • Aircraft also have to have Marine Radios which can also be utilised. As the owner of the FWADC, overall control will be via AMSA. Similarly, OSRL will be in overall control of their aircraft. Daily operations will be directed by the Operations Chief in consultation with AMSA, OSRL (if involved) and AMOSC. The Incident Commander remains in control of all incident response activities. Communications will be in accordance with the agreed communications plan.

Task	Guidance
	A JHA will be completed prior to each activity and will be signed by all personnel involved. All aircraft and aircrew involved with the operation are to be certified fit to conduct the task in accordance with CASA regulations. The Aerotech Liaison Officer is to confirm the serviceability and sign off aircraft sea survival equipment. This will be audited by AMSA before the first flight. Individuals will supply their own PPE relevant to the task. Fuel and dispersant handling PPE requirements will be specified in relevant SDS'. As a minimum, all other activities PPE requirement will be full cover, steel caps, high visibility and sun protection. Additional controls will be implemented as necessary. In case of an emergency on the airstrip or field, the muster area will be at the standard Karratha Airport muster location(s).
Ongoing dispersant operations	Aerial dispersant operations will be directed, as part of the IAP, to operate in situations where the greatest effectiveness of the dispersant is likely to result; and operations can be conducted in such a manner as to allow for other oil spill marine operations. Loading and fuelling of the aircraft will be under the supervision of the Loading Supervisor, and to the satisfaction of the pilot. Dispersant application rate is to be set at 50 litres per hectare with a swath width of 22 m unless otherwise determined by test spray runs. The spray area will be determined by the movement of oil and as directed by the AAC in [insert spotter platform call sign]. When tasked, the spotter platform [insert helicopter or plane call sign, most likely to be CHC] will proceed to the target area and identify the target site. It will then call in [insert aircraft call sign(s) or aircraft type/Operator] and direct the dispersant attack. After spray is exhausted or endurance of aircraft is reached [insert Aircraft call sign(s)] will return for resupply. The AAC will complete the Aerial Dispersant Monitoring Log and provide this information to the Operations Chief who then provides this to the Planning Chief to incorporate into the IAP process. The pilot of the air tractor will complete an Aerial Dispersant Application Log and provide this to the Operations Chief, who then passes this information onto the Planning Chief. Final number of spray runs shall be determined by consultation between AMSA, VOGA, AMOSC and Aerotech. VFR shall be observed at all times, along with standard radio protocols and monitoring. Pilots will maintain separation. Personnel lists will be finalised at the time of the spill. All personnel will be logged on and off site, and all personnel in aircraft will be noted before departure. Typical functions required in FWADC operations are: • Air base manager • Dispersant loading supervisor and crew • Pilots • Aerial spotter to direct application of dispersant. During the operational phase, only personnel with an operational need will be allowed on the airfield unless authorised by Aerotech Liaison Officer.
Volume of dispersant and number of aircraft required	The volume of dispersant required for an operation depends on the application rate which is the ratio of dispersant to oil required for effective dispersion (which is dependent on average slick thickness) and the size of the target area to be sprayed. A trial application of 1:20 is used as a starting point in which to determine the most appropriate application rate.

Task	Guidance
	Continuous spills however present an area of fresh oil that can be treated with dispersant on a daily basis until the spill is contained. In recognising that oil spreads at variable rates and thickness is not consistent across the slick, ITOPF (2014c) suggest that the most practical and efficient solution is to target the thickest parts of the slick. For planning purposes, application target volumes have been conservatively estimated based on oil spill modelling results and ITOPF Technical Information Paper 4. The number of days for the operation is based on the length of time that the oil remains dispersable. A maximum required dispersant volume of 38 m^3 per day is required, after 24 hours. Capability determination assessments are documented in the OSR Capability Review [VOG-7000-RH-0009].
Monitoring dispersant effectiveness (OMP4a)	It is extremely difficult to quantify the percentage of oil dispersed so visual observation of effectiveness will assess if the dispersant is having a positive effective of dispersing oil into the water column or if it is not working as intended. The AAC will brief the Operations Chief of the dispersant operations and observed effectiveness based on the Aerial Dispersant Monitoring Log and observations made of dispersant and oil mixing within the water column and the resultant colour of the oil mix. Use the OSRL Dispersant Application Monitoring Handbook to determine visually if the dispersant is having an effect. OMP4a will be inititated for implementation by the OSRL OSM monitoring service providers.
Debriefing	A debrief of the operation is to be conducted with the Operations Chief to confirm appropriate actions were undertaken and to identify issues/concerns/improvements to operations. This will occur on a daily basis. Findings from the debrief and completed Aerial Dispersant Application Logs must be reported back to the Planning Chief so that situational awareness can be maintained for incident action planning. On completion of air operations respective maintenance procedures are to be conducted by individual organisations if necessary. Any serviceability issues are to be reported to the Area Staging Manager at Karratha Airport.
Stockpile management	At the end of each day the Planning Chief (via the Resources Unit in the Planning section) compiles the records of dispersant use and determines the amount of dispersant on hand and what is required for the next mission. Delivery of extra stocks is organised by the Logistics Chief. WA stockpiles will be accessed first while the need for interstate and international stockpiles is evaluated in the IAP process. All dispersants have been shown to be effective on Wandoo crude. Stockpiles will need to be accessed for dispersant operations longer than five days or with more than one air tractor or if the OSRL aircraft is mobilised. Additional National Plan stockpiles may be accessed through AMSA and international stocks of dispersant may be accessed through OSRL. Manufacturing of dispersant in Australia is currently being investigated by AMOSC as a potential source of supplies for prolonged dispersant operations. Current lists of stockpile volumes and locations are available on the OSRL, AMSA and AMOSC websites. Application rates may be varied if considered appropriate to ensure longevity of dispersant stockpiles.
Incident action planning	At the completion of the aerial missions, the Planning Chief will review the aerial dispersant operations and provide a recommendation to the Incident Commander for future aerial dispersant operations.

Task	Guidance
Effectiveness guidance for response strategy	Visual observation of the colour of the dispersed oil plume is a reliable indicator of effective dispersant application via aerial and vessel observers (using tools such as the OSRL field guide for dispersant use and monitoring) (OMP4a). Fluorometry using 'effective' and 'non-effective' thresholds (OMP4a) The application method (aerial and vessel) and dose rate of dispersant tool, may increase effectiveness of dispersant. Monitoring and modelling of dispersed oil within the water column (OMP4s). Planning Chief will use outputs from OMP1 and OMP4a to consider if dispersant operations affect the following: • Time to shoreline impact is increased. • Average and maximum volume of oil ashore is reduced. • Average and maximum length of shoreline contacted is reduced. • Probability of oil contact to shorelines is reduced. • The impacts and accumulation of entrained oil is compared to the reduction and impacts of surface oil (OMP2).

Table 11-6: Chemical dispersant minimum resource requirements aerial operations

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Air base support	Aircraft refuelling and dispersant loading facilities. Briefing facility for aviation operations teams.	Commercial air base close to Wandoo Field, preferably Karratha Airport. Logistical support to sustain/ maintain aerial operations.	24 hours.	Commercial air base close to Wandoo Field, preferably Karratha Airport. Logistical support to sustain/ maintain aerial operations.	Commercial air base close to Wandoo Field, preferably Karratha Airport. Logistical support to sustain/ maintain aerial operations.	Commercial air base close to Wandoo Field, preferably Karratha Airport. Logistical support to sustain/ maintain aerial operations.
Dispersant stocks	Dispersant available at the air base for loading into the aircraft when needed over the period of the spill.	90 m^3 within 36 hours.	38 m^3 sprayed in 30 hours; 90 m^3 delivered on-site within 36 hours.	Up to 38 m^3 per day delivered by air tractor and/or OSRL aircraft.	Up to 38 m^3 per day delivered by air tractor and/or OSRL aircraft.	Up to 38 m^3 per day delivered by air tractor and/or OSRL aircraft.
Spotter aircraft	For each sortie, a helicopter or fixed wing aircraft is able to accurately direct the air tractor pilot when apply dispersant.	1 x Trained spotter. 1 x Aerial platform.	24 hours.	2 x Trained spotters. 2 x Aerial platforms.	2 x Trained spotters. 2 x Aerial platforms.	4 x Trained spotters. 2 x Aerial platforms.

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Aerial application means	Dispersant rapidly applied to the thickest part of the slick at the rate of 1:20 (dispersant oil ratio).	2 x Air tractors (1.9 m^3 capacity) – 2 sorties each within 30 hours. 3 x Air tractors (1.9 m^3 capacity) – 5 sorties each within 48 hours. Pilots for the same	2 x Air tractors (1.9 m^3 capacity) – 2 sorties each within 30 hours. 3 x Air tractors (1.9 m^3 capacity) – 5 sorties each within 48 hours. Pilots for the same	4 x Air tractors – 5 sorties per day (minimum 1.9 m^3 dispersant capacity). Pilots for the same.	4 x Air tractors – 5 sorties per day (minimum 1.9 m^3 dispersant capacity). Pilots for the same.	4 x Air tractors – 5 sorties per day (minimum 1.9 m^3 dispersant capacity). Pilots for the same.
	Availability of OSRL aircraft.		1 x Hercules – (8.2 m^3 capacity) available from 48 hours.	1 x Hercules – 5 sorties per day (8.2 m^3 capacity).	1 x Hercules – 5 sorties per day (8.2 m^3 capacity).	1 x Hercules – 5 sorties per day (8.2 m^3 capacity).
Safety aircraft/ rescue vessels	For each sortie, a helicopter is available to be used for search and rescue.	Helicopter. Responding vessels.	30 hours.	Helicopter. Responding vessels.	Helicopter. Responding vessels.	Helicopter. Responding vessels.

11.2.2.2 Marine Dispersant Operations

Table 11-7: Marine dispersant application

Task	Guidance
Marine delivery of dispersant will take place if aerial application is not possible or if there are parts of the slick that are better targeted by a vessel. Marine dispersant operations will be used to treat oil that has 'built-up' over preceding days in continuous spill events. The objective of the marine dispersant operations will be to disperse oil that has formed windrows and through trajectory modelling may imminently impact environmental sensitivities, in particular the Dampier Archipelago and the other shorelines. The output will be to have vessels continuously 'chasing' and spraying dispersant onto the oil. The Planning and Operations Chiefs will decide according to the situational awareness gained if marine based dispersant use is activated.	
Identify marine operating base	Logistics Chief to identify marine operating base that can accommodate vessel and crews is close to the response site – most likely to be Toll (refer to ER Logistics Management Plan for contractor details).
Source vessel	Logistics Chief to source offshore vessel that either has dispersant spray equipment already fitted; or a vessel that is able to secure an afedo dispersant spray system to the vessel (refer to ER Logistics Management Plan for contractor details).
Dispersant stocks	Planning Chief to confirm with Logistics Chief the volume of dispersant to be mobilised to marine operating base. Move dispersant and mobilise a dispersant transfer pump to be able to transfer dispersant from IBCs to vessel storage.

Task	Guidance
	Consult the OSR Capability Review [VOG-7000-RH-0009] for additional dispersant calculation and stockpile information.
Dispersant spray system	Logistics Chief to source an afedo dispersant spray system (refer to ER Logistics Management Plan for contractor details).
Arrange for a spotter plane to accompany marine vessel	Logistics Chief to secure a helicopter to or alternative aircraft to provide aerial dispersant spotter duties. Aircraft will be required to fly above the marine vessel and to advise pilot when to turn spray on and off. Requires communication plan between the aircraft and vessel.
Complete SIMA to justify test run	Planning Chief completes SIMA pro-forma with what is known about the spill at the time to record justification for testing dispersant. SIMA template available in Appendix E.
Test run by marine vessel	Dispersant will be applied within the dispersant application zone (Section 7.4.2.1). Seasonal environmental conditions and sensitivities will dictate application of dispersant from marine vessels. An analysis to determine these specific sectors will be undertaken at the time by the Planning Chief and implemented by the Aviation and Marine Units in Operations. Test application runs of approximately 100 m in length will be made and several passes may be required to determine dispersant effectiveness. Vessel personnel will observe the effectiveness of the dispersant on the oil slick and will report if dispersant is having a mixing effect on the oil and complete the Dispersant Monitoring Application Log (OSRL Handbook). Photographs will be taken by vessel personnel to provide to the Planning Chief and Environment Unit. The master of the marine vessel will complete a Dispersant Application Log and provide this to the Operations Chief upon completion of the mission. The Operations Chief provides this detail to the Planning Chief.
Monitoring dispersant effectiveness (OMP4a)	Vessel personnel will brief the Operations Chief of the dispersant operations and observed effectiveness based on the Aerial Dispersant Monitoring Log and observations made of dispersant and oil mixing within the water column and the resultant colour of the oil mix. Use the OSRL Dispersant Application Monitoring Handbook to determine visually if the dispersant is having an effect. OMP4a will be initiated for dispersant efficiacy monitoring.
Operational SIMA	To determine if ongoing dispersant application should continue.
Ongoing dispersant operations	Marine dispersant operations will be directed, as part of the IAP, to operate in situations where the greatest effectiveness of the dispersant is likely to result; and operations can be conducted in such a manner as to allow for other oil spill marine operations.
Debriefing	A debrief of the operation is to be conducted with the Operations Chief to confirm appropriate actions were undertaken and to identify issues/concerns/improvements to operations. This will occur on a daily basis. Findings from the debrief and completed Dispersant Application Logs must be reported back to the Planning Chief so that situational awareness can be maintained for incident action planning. On completion of air and marine operations respective maintenance procedures are to be conducted by individual organisations if necessary.
Stockpile management	At the end of each day the Planning Chief (via the Resources Unit in the Planning section) compiles the records of dispersant use and determines the amount of dispersant on hand and what is required for the next mission. Delivery of extra stocks is organised by the Logistics Chief.
Incident action planning	At the completion of the dispersant operations, the Planning Chief will review the operations based on a briefing from the Operations Chief and provide a recommendation to the Incident Commander for future dispersant operations.

Task	Guidance
Effectiveness guidance for response strategy	Visual observation of the colour of the dispersed oil plume is a reliable indicator of effective dispersant application via aerial and vessel observers (using tools such as the OSRL field guide for dispersant use and monitoring) (OMP4a). Fluorometry using 'effective' and 'non-effective' thresholds (OMP4a). The application method (aerial and vessel) and dose rate of dispersant tool, may increase effectiveness of dispersant. Monitoring and modelling of dispersed oil within the water column (OMP4a). Planning Chief will use outputs from OMP1 and OMP4 to consider if dispersant operations affect the following: • Time to shoreline impact is increased • Average and maximum volume of oil ashore is reduced • Average and maximum length of shoreline contacted is reduced • Probability of oil contact to shorelines is reduced. The impacts and accumulation of entrained oil is compared to the reduction and impacts of surface oil OMP2 – Water quality assessment; and SMP7 – Marine fish and elasmobranch assemblages assessment.

Table 11-8: Chemical dispersant minimum resource requirements marine operations

Means/Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Marine operating base	Marine operating base that can accommodate vessel and crews is close to the response site.	Wharf space. Loading areas. Forward operating area.	24 hours.	Wharf space. Loading areas. Forward operating area.	Wharf space. Loading areas. Forward operating area.	Wharf space. Loading areas. Forward operating area.
Dispersant stocks	Dispersant available at the marine base for loading when needed	10 m^3 per vessel.	10 m^3 available in 24 hours and 20 m^3 within 48 hours.	10 m^3 per day per vessel.	10 m^3 per day per vessel.	10 m^3 per day per vessel.
Marine delivery	Logistics to locate dispersant vessel and the dispersant spray system to mount a response for up to 5 days at sea.	2 x Work vessels suitable for the NWS. Crew and master for same.	1 x work vessel deployed to spill site 24 hours 2 x within 48 hours	Available vessels suitable for the NWS. Crew and master for the same.	Available vessels suitable for NWS. Crew and master for the same.	Available vessels suitable for NWS. Crew and master for the same.
Dispersant spray system	A system that can effectively and efficiently apply dispersant from IBCs on deck.	2 x Afedo spray sets and ancillaries. 2 PAX to operate the same.	1 x Afedo set within 24 hours on site. 2 x within 48 hours.	1 x Afedo spray sets and ancillaries per vessel. 2 PAX to operate the same.	1 x Afedo spray sets and ancillaries per vessel. 2 PAX to operate the same.	1 x Afedo spray sets and ancillaries per vessel. 2 PAX to operate the same.

Means/Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Spotter aircraft	A helicopter or fixed wing is able to accurately direct the vessel operator where the oil is.	2 x Trained spotters. 2 x Aerial platforms. Pilots for same.	1 x within 24 hours on site. 2 x within 48 hours.	2 x Trained spotters. 2 x Aerial platforms. Pilots for same.	2 x Trained spotters. 2 x Aerial platforms. Pilots for same.	2 x Trained spotters. 2 x Aerial platforms. Pilots for same.

11.2.3 Mechanical Dispersion Strategy

Table 11-9: Mechanical dispersion operations

Task	Guidance
The Planning Chief will recommend this strategy be implemented based on information collected through monitoring and evaluation. If chemical dispersant is working mechanical dispersion may not be required.	
Conduct SIMA	The Environment Unit within the Planning Team of the ICT will use the outputs from monitoring and evaluation to determine if a protection priority is likely to be impacted by oil. Mechanical dispersion activities may be directed to areas of oil that could potentially impact a receptor which is unable to be treated by other response strategies. Mechanical dispersion activities will only be conducted in water deeper than 20 m.
Secure offshore work vessel	Logistics Chief to secure vessels through current contracts or vessels of opportunity to: • Prop wash the spilled products (if permitted by vessel master and owner) • Agitate using the fire monitor or alternative spray system. Enhancement of weathering process such as natural dispersion and dilution of oil into the water column.
Secure spotter aircraft	Logistics Chief to secure helicopter or fixed wing aircraft to direct vessels into areas of the slick that require manual dispersion. Spotter aircraft pilot to be able to communicate with marine vessel. Operations Chief to brief pilot on what parts of the slick should be targeted.
Deploy vessels	Vessels will be deployed from Dampier. Masters of vessels being used for this operation will have communication with aerial surveillance so that the leading edge of a slick can be targeted.
Develop waste management plan	Planning Chief to develop waste management plan that prevents translocation of oil from hot zones to warm and cold zones. The Planning Team will be cognisant of the potential for transferring oily waste when the vessel returns to Dampier, and will ensure that provisions have been made in the waste management plan to manage the risk of secondary contamination. It is possible that the resources for this response strategy may be combined with that of monitoring and evaluation or transportation for shoreline cleanup so that maximum resource efficiencies can be achieved.
Incident action planning	At the completion of mechanical dispersion operations, the Planning Chief will review the operations based on a briefing from the Operations Chief and provide a recommendation to the Incident Commander for future mechanical dispersion activities.

Task	Guidance
Effectiveness guidance for response strategy	OMP2 – Water quality assessment. SMP7 – Marine fish and elasmobranch assemblages assessment. Visual observation to determine whether oil is dispersing into the water column from the vessel and aerial observations: • Oil is mixing within the water column • Surface oil is reduced.

Table 11-10: Mechanical dispersion minimum resource requirements

Means/Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Vessel	Prop wash the spilled hydrocarbons. Enhancement of weathering process such as natural dispersion and dilution of oil into the water column.	Opportunistic offshore support vessel.	N/A	Opportunistic offshore support vessel/s.	Opportunistic offshore support vessel/s.	Opportunistic offshore support vessel/s.
Fire hose	Agitate using the fire monitor or alternative spray system. Enhancement of weathering process such as natural dispersion and dilution of oil into the water column.	Working fire monitor/spray system. Crew to operate.	N/A.	Working fire monitor/ spray system. Crew to operate.	Working fire monitor/ spray system. Crew to operate.	Working fire monitor/ spray system. Crew to operate.

11.2.4 Containment and Recovery Strategy

Table 11-11: Containment and recovery operations

<table>
<tr><th>Task</th><th>Guidance</th></tr>
<tr><td>Planning Chief to undertake a SIMA of containment and recovery operations and consider the following:</td><td>• Is the slick is moving toward a sensitive receptor – consider time to impact, volume and probability?
• Are the sea-state and weather conditions amenable for effective boom and skimmer deployment?
• Is the weathered oil able to be recovered with skimmers?
• Is there a safe operating environment for responders?</td></tr>
<tr><td>Do weather conditions and sea state permit safe and effective deployment of booms and skimmers?</td><td>Metocean conditions required for safe and effective boom and skimmer deployment:
<table>
<tr><th>Equipment</th><th>Maximum sea state (Beaufort scale)</th><th>Maximum current (knots)</th><th>Winds (knots)</th></tr>
<tr><td>Booms</td><td>3-4</td><td>1</td><td>14-22</td></tr>
<tr><td>Weir skimmer</td><td>1</td><td>1</td><td>7</td></tr>
<tr><td>Disc skimmer</td><td>2-3</td><td>1</td><td>11-14</td></tr>
<tr><td>Vacuum skimmer</td><td>1</td><td>1</td><td>7</td></tr>
</table></td></tr>
</table>

Task	Guidance
Does containment and recovery appear feasible?	BER is a limiting factor of effective containment and recovery operations. An estimation of the resources required and potential volume of oil able to be recovered for Category A and C spills is provided in the OSR Capability Review [VOG-7000-RH-0009]. Considerations to take into account: • Is the oil thick enough for effective recovery? • Will containment and recovery treat a notable portion of the spill volume?
If the decision is made in the ICT to proceed with containment and recovery (based on Planning Chief's recommendation), the following tasks are to be completed.	
Mobilise vessels suitable for either offshore or near shore operations.	Work vessels that can carry and deploy offshore booms and skimmers are required for this strategy along with a mechanism for storing and transporting waste. Logistics Chief to secure two offshore work vessels or a vessel from AMSNOR based in Dampier. Ideally, vessels would have the ability to carry, deploy and retrieve booms and skimmers up to the size of ro-boom and the GT-185 weir skimmers (i.e. GT-185 and Desmi 250), as well as temporary waste storage. Deployment of ro-boom, large skimmers and at-sea waste storage equipment requires vessels that can maintain the correct configuration of the towed booms at very low speeds through the water. The OSRL Containment and Recovery Field Guide provides some guidance on the ideal vessel specifications required for this type of operation. The operational time of the vessels on the water conducting this response activity will be dictated by the available waste collection capacity; once waste tanks are full the vessels will demobilise from the oil site to unload collected waste. To maintain longer operational periods, the Planning Chief may consider an application to AMSA (Commonwealth waters) or DoT (State waters) to decant oily water from waste collection tanks back into the oil plume collected behind the boom. The total amount of oily waste water returned to shore may be reduced by at-sea decanting (allowing oil to settle on the surface of the waste storage container and decanting water from the bottom). The IPIECA Oil Spill JIP report 'The Use of Decanting during Offshore Oil Spill Recovery Operations', provides some guidance on this practice.
Mobilise booms and skimmers	Logistics Chief to mobilise booms, skimmers and temporary waste storage equipment from AMSNOR, the AMOSC stockpiles in Broome and Exmouth, as well as the AMSA National Plan stockpiles in Dampier and Fremantle. Ongoing response efforts may require the mobilisation of equipment from interstate stockpiles. Specifications regarding the type of booms, skimmers and waste storage required are described in the OSR Capability Review [VOG-7000-RH-0009].
Mobilise trained equipment operators	Logistics Chief to source people with experience and training operating equipment from marine vessels from: • AMSNOR • AMOSC core group members • AMSA NRT • WA DoT State Response Team. Logistics Chief to ensure that personnel forms and information is completed and forwarded to the Finance Chief for cost tracking. This equipment will only be deployed and retrieved by trained personnel such as those available through AMSNOR, the AMOSC Core Group, AMSA NRT, DoT State Response Team or OSRL. Standard Operating Procedures are available in the AMSA OSR OH&S Manual.

Task	Guidance
Spotter plane to direct operations	Logistics Chief to activate a helicopter or fixed wing aircraft to direct vessels to thickest part of slick to contain and recover oil. CHC or Karratha Flying Service Aircraft will need ability to communicate with marine vessels and a communication plan as well as observation logs to report back to the Operations Chief.
Establish a forward operating base for temporary storage of equipment and waste	Logistics Chief to activate a Forward Operating Post at Toll in Dampier where VOGA has personnel who can manage the receipt and deployment of equipment. It is in this yard where equipment can be stored and readied for deployment. Toll will manage the transport of equipment that VOGA requires in Dampier.
Secure trained personnel	This equipment will only be deployed and retrieved by trained personnel such as those available through AMSNOR, the AMOSC Core Group, AMSA NRT DoT State Response Team or OSRL. Standard Operating Procedures are available in the AMSA OSR OH&S Manual.
Deploy booms, skimmers and temporary waste storage	Deployment of ro-boom, large skimmers and at-sea waste storage equipment requires vessels that can maintain the correct configuration of the towed booms at very low speeds through the water. The OSRL Containment and Recovery Field Guide provides some guidance on the ideal vessel specifications required for this type of operation.
Develop waste storage and transport plan	Logistics Chief in consultation with Planning Chief activates temporary waste storage capacity held by Toll (IBCs through ToxFree); evaluate the feasibility of securing the Caltex 2 x 16KT tankers on charter and rotate between Dampier and Singapore; and activate towable storage barges such as lancer barges held by AMSA in Dampier and Fremantle. Consideration will be made in the waste management plan for how to best manage contaminated equipment when it returns from operations to Dampier. A hot, warm and cold zone will be established in the laydown area along with a decontamination station and plan to manage the risk of secondary contamination. The operational time of the vessels on the water conducting this response activity will be dictated by the available waste collection capacity; once waste tanks are full the vessels will demobilise from the oil site to unload collected waste. To maintain longer operational periods, an application will be made by the ICT to AMSA (Commonwealth waters) or DoT (State waters) to decant oily water from waste collection tanks back into the oil plume collected behind the boom. The total amount of oily waste water returned to shore may be reduced by at-sea decanting (allowing oil to settle on the surface of the waste storage container and decanting water from the bottom). The IPIECA Oil Spill JIP report 'The Use of Decanting during Offshore Oil Spill Recovery Operations' provides some guidance on this practice.
Incident action planning	At the completion of the containment and recovery operations, the Planning Chief will review the operations based on a briefing from the Operations Chief and provide a recommendation to the Incident Commander for future containment and recovery operations.
Effectiveness guidance for response strategy	Visual observation to determine whether booming operations are effective, more specifically is there no evidence of undercutting (losing hydrocarbon beneath the skirt of the boom), splash over (hydrocarbon splashing over the top of the boom due to wave energy) and entrainment issues (recovery is too slow resulting in too much hydrocarbon collecting in the apex of the boom). Boom type, towing speed, weather, containment configuration and currents can all affect the effectiveness of the above.

Task	Guidance
	Visual observation to determine whether recovery operations are effective, more specifically is hydrocarbon being recovered. Is the type of recovery system appropriate for the hydrocarbon product and its fate? What is the ratio of hydrocarbon to water? Are the temporary storage operations sufficient to maintain recovery? Recovery system type, recovery methodology (skimming while vessels are moving) and timing can be altered to increase effectiveness. The Planning Chief will consider: • The potential to contain oil contained booms. • The potential for oil recovery – weir skimmers recovering > 10% oil; oleophilic skimmers recovering > 50% oil. • Availability of waste storage of required capacity.

Table 11-12: Containment and recovery minimum resource requirements

Means/Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Two vessel booming tasking (U sweep or V sweep) and/or NOFI current buster						
Marine operating base	Marine operating base that can accommodate vessel and crews is close to the response site.	Wharf space. Loading areas. Forward operating area.	24 hours.	Wharf space. Loading areas. Forward operating area.	Wharf space. Loading areas. Forward operating area.	Wharf space. Loading areas. Forward operating area.
Booming systems	A system that can effectively and efficiently corral oil offshore.	6 x 400 m ro-booms (or similar). NOFI current buster	48 hours to marine operating base.	2,400 m NOFI current buster	2,400 m NOFI current buster	2,400 m NOFI current buster
Recovery systems	High-capacity skimmers that can recover both fresh and weathered crudes.	6 x Active weir recovery systems or similar.	48 hours to marine operating base.	6	6	6
Waste storage	500 m^3 of on-board or towable storage	Varying capacities of IBCs, totalling 500 m^3, or other suitable combined storage, e.g. towable storage barges.	48 hours to marine operating base.	2,500 m^3	10,000 m^3	20,000 m^3

Means/Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Spotter aircraft	A fixed wing or helo is able to accurately direct the vessel operator where the oil is.	1 x Trained spotter. 1 x Aerial platform. Pilots for the same.	48 hours	1 x Trained spotter. 1 x Aerial platform. Pilots for the same.	1 x Trained spotter. 1 x Aerial platform. Pilots for the same.	2 x Trained spotters. 1 x Aerial platform. Pilots for the same.
Marine delivery	Vessels that can store up to 500 m^3 of oil/water waste, skimmer system and 4 tonnes bollard pull. Vessel to lead the boom operation, 4 tonnes bollard pull.	12 x Work vessels suitable for the NWS. Crew (7 for boom deployment and recovery, oil storage and transfer management) and master for the same.	48 hours on site.	Available vessels suitable for the NWS. Crew (7 for boom deployment and recovery, oil storage and transfer management) and master for the same.	Available vessels suitable for the NWS. Crew (7 for boom deployment and recovery, oil storage and transfer management) and master for the same.	Available vessels suitable for the NWS. Crew (7 for boom deployment and recovery, oil storage and transfer management) and master for the same.
Single vessel side sweep operation and/or NOFI current buster						
Marine operating base	Marine operating base that can accommodate vessel and crews is close to the response site.	Wharf space. Loading areas. Forward operating area.	24 hours.	Wharf space. Loading areas. Forward operating area.	Wharf space. Loading areas. Forward operating area.	Wharf space. Loading areas. Forward operating area.
Booming systems	A system that can effectively and efficiently corral oil offshore.	Side sweep boom such as Troilboom solid buoyancy sweeping boom with outrigger and collection point. NOFI current buster. 5 x Crew to operate the system.	48 hours to marine operating base.	Side sweep boom such as Troilboom solid buoyancy sweeping boom with outrigger and collection point. NOFI current buster. 5 x Crew to operate the system.	Side sweep boom such as Troilboom solid buoyancy sweeping boom with outrigger and collection point. NOFI current buster. 5 x Crew to operate the system.	Side sweep boom such as Troilboom solid buoyancy sweeping boom with outrigger and collection point. NOFI current buster. 5 x Crew to operate the system.
Recovery systems	High-capacity skimmers that can recover both fresh and weathered crudes.	1 x Active weir skimmer recovery system or similar, e.g. GT1852 x Crew to operate the system.	48 hours to marine operating base.	1 x Active weir skimmer recovery system or similar, e.g. GT1852 x Crew to operate the system.	1 x Active weir skimmer recovery system or similar, e.g. GT1852 x Crew to operate the system.	1 x Active weir skimmer recovery system or similar, e.g. GT1852 x Crew to operate the system.

Means/Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Waste collection, storage and transport	500 m^3 of on-board or towable storage.	100 m^3 IBCs, or on-board storage tanks, or towable storage barges. Total 500 m^3.	48 hours to marine operating base.	100 m^3 IBCs, or on-board storage tanks, or towable storage barges. Total 500 m^3.	100 m^3 IBCs, or on-board storage tanks, or towable storage barges. Total 500 m^3.	100 m^3 IBCs, or on-board storage tanks, or towable storage barges. Total 500 m^3.
Spotter aircraft	A fixed wing or helo is able to accurately direct the vessel operator where the oil is.	1 x Trained spotter. 1 x Aerial platform. Pilots for the same.	48 hours on site.	1 x Trained spotter. 1 x Aerial platform. Pilots for the same.	1 x Trained spotter. 1 x Aerial platform. Pilots for the same.	1 x Trained spotter. 1 x Aerial platform. Pilots for the same.
Marine delivery	Vessel that can carry 100 m^3 of oil/water waste, skimmer system, and effectively 4 tonnes bollard pull.	1 x Large work vessel and one tender or smaller work vessel to assist with recovery operations. Crew and master for same.	48 hours on site.	2 x Large work vessels and one tender or smaller work vessel to assist with recovery operations. Crew and master for same.	2 x Large work vessels and one tender or smaller work vessel to assist with recovery operations. Crew and master for same.	2 x Large work vessels and one tender or smaller work vessel to assist with recovery operations. Crew and master for same.

11.2.5 Protection and Deflection Strategy

Table 11-13: Protection and deflection operations

Task	Guidance
Analysis of trajectory modelling and SIMA	Planning Chief and Environment Unit Leader analyse trajectory models (pre-event modelling and real-time modelling) to predict which shorelines may be impacted by oil, time to impact, probability and quantity of oil to shore. Priority resource protection areas are compared with the shorelines that are predicted to be oiled and operational/tactical plans are activated. Outputs from the monitoring and evaluation strategy will confirm protection priorities that require action to prevent oiling. Priority of the implementation of tasks to support this strategy will be focused on protecting the highest shoreline and near-shore environmental sensitivities. Oil that has not been successfully chemically or physically dispersed or contained and recovered at sea may come ashore and strand. Using deterministic modelling during a spill, combined with situational awareness gained through ongoing monitoring and evaluation, VOGA will implement this strategy in these areas to protect sensitive shorelines.
Analysis of aerial observation and current situational awareness	Planning Chief and Environment Unit Leader to use aerial surveillance data, information gathered by the Situation Unit and the protection priorities identified in pre-spill planning as a starting point for deployment of protection and deflection operations.
Understanding of real time currents and tides	Booming configuration will depend on the tidal movements and speed of currents in the location in which booms are to be deployed.

Task	Guidance
	Booms will fail when the forces of water movement push oil over or under the boom, or when there is failure of anchoring systems. This can be in currents of as little as 1 knot, however, there are ways in which booms can be set up (e.g. chevron booming, staggered booming) so that oil is directed with the current onto another boom or into a collection area.
SIMA	Priority of the implementation protection and deflection is to oiling of shorelines with the highest environmental sensitivities. Planning Chief and Environment Unit leader in consultation with DoT to determine where the optimum mitigation outcomeswill be achieved through protection and deflection activities. Shoreline protection priorities are mangrove environments and identified turtle nesting beaches during nesting and hatching season. Where trajectory modelling indicates likely multiple stranding of oil, and a SIMA indicates no likely worse outcome, shores may be left to allow oil to collect utilising areas of natural containment. Identification and request of relevant Tactical Response Plans from other titleholders for priority shorelines
Determine and source resources required and booming configuration	Planning Chief to liaise with Operations Chief to determine type of booms (including ancillaries such as anchors and power packs for land sea booms) required and a booming configuration that can effectively and efficiently direct oil away from a resource, or prevent contact by oil. Refer to OSRL handbook for Shoreline Operations for recommended booming configurations. Use of available Tactical Response Plans as guidance. Logistics Chief to source booms and skimmers (if being used to recover oil) from AMOSC stockpiles and the AMSA National Plan stockpiles. Logistics Chief to secure vessels (including crew) and equipment operators (AMOSC core group or AMSA NRT) to deploy booms and vessels to assist in shallow areas. Booms can be deployed in various configurations to either exclude oil from a sensitivity or deflect the oil away from it. Trained operators will be required for this task and are available from the AMOSC Core Group, AMSA NRT or the DoT State Response Team. Protection and deflection strike teams will establish exact equipment and resource requirements for specific shoreline protection and deflection according to the specific incident. However, each team will have a minimum resource make up according to the response quick guides in each spill category as detailed in Table 10-6, with further resources being brought in dependent on the scale and nature of the incident. Capability determination details are documented in the OSR Capability Review (VOG-7000-RH-0009). Daily inspection and maintenance of deployed booms to be undertaken by response personnel.
Induction	Operations Chief to ensure that teams are informed of how to minimise damage to flora and avoid encounters with fauna. Induction and training of onshore teams accessing to uninhabited islands to include that spill response teams should avoid disruption of environment and take practical tactical precautions to avoid contact with flora and fauna. The number of staff and teams required will vary according to the sensitivities being protected.
Marine vessel transport of people and equipment	Logistics Chief to secure marine vessel(s) capable of carrying crew and spill equipment to remote islands.
Aerial surveillance and/or transport	Logistics Chief to secure aircraft to enable ongoing aerial surveillance of shorelines and/or transport of people and equipment.

Task	Guidance
Consider constraints	The major constraint for protection and deflection, especially in areas of northwest WA is the tidal range of and current speed that may be experienced. It may not physically be possible to deploy protection and deflection booming systems if the tide and current are not favourable. Other constraints include: • Access to remote islands and mainland beaches • Biosecurity issues associated with moving people and equipment between remote islands and the mainland • Access to sites (habitat, terrain, distance from the mainland, landing/mooring sites for vessels) • Transport of equipment to remote sites • Weather and sea state • Hazardous wildlife.
Incident action planning	At the completion of the containment and recovery operations, the Planning Chief will review the operations based on a briefing from the Operations Chief and provide a recommendation to the Incident Commander for future protection and deflection operations.
Effectiveness guidance for response strategy	Visual observation to determine whether a booming operation is 'protecting' and/or 'deflecting' the impact of hydrocarbon towards sensitivity. Boom type, deployment angle, anchoring, quantity and variation in materials can all be altered to increase effectiveness.

Table 11-14: Protection and deflection minimum resource requirements

Means/ Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Landside (based on one team, resources will need to be scaled up for additional teams)						
Marine vessels	Marine vessel(s) capable of carrying crew and spill equipment to remote islands. Capable of logistics support/accommodation for 10 POB, crew, accessing remote islands.	Aluminium catamarans and/or flat bottom boats.	48 hours on site.	4 x Aluminium catamarans and/or flat bottom boats.	8 x Aluminium catamarans and/or flat bottom boats.	16 x Aluminium catamarans and/or flat bottom boats.
Crew	Crew capable of securing booms.	1 x Trained operator/Team Leader. 4 x Labourers.	48 hours on site.	5 x Trained operators/ Team Leaders. 20 x Labourers.	10 x Trained operators/ Team Leaders. 40 x Labourers.	20 x Trained operators/ Team Leaders. 80 x Labourers.
Booming systems	A system that can effectively and efficiently direct or prevent the movement of oil.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms.	48 hours on site.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms.

Means/ Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Marine side (based on one team, resources will need to be scaled up for additional teams)						
Vessel	Vessel capable of assisting land-side crews to secure booms in waterways and in the shallow seas.	1 x Shallow draft work boat. Operational crew for same.	48 hours on site.	4 x Shallow draft work boat. Operational crew for same.	8 x Shallow draft work boats. Operational crew for same.	16 x Shallow draft work boats. Operational crew for same.
Crew	Crew capable of securing booms.	1 x Trained Operator/Team Leader. 2 x Labourers on-board.	48 hours on site.	2 x Trained Operators/ Team Leaders. 4 x Labourers on-board.	16 x Trained Operators/ Team Leaders. 32 x Labourers on-board.	32 x Trained Operators/ Team Leaders. 64 x Labourers on-board.
Booming systems	A system that can effectively and efficiently direct or prevent the movement of oil.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms. Crew to operate the system.	48 hours on site.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms. Crew to operate the system.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms. Crew to operate the system.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms. Crew to operate the system.

11.2.6 Shoreline Cleanup Strategy

Table 11-15: Shoreline cleanup operations

Task	Guidance
Shoreline cleanup, subject to amenable weather conditions and access, is the use of a variety of cleanup methods on shorelines to remove stranded hydrocarbons, and to minimise the potential ongoing environmental damage caused by those hydrocarbons.	
Analysis of trajectory modelling and hydrocarbon properties and weathering at sea (OMP1)	Planning Chief and Environment Unit Leader analyse trajectory models (pre-event modelling and real-time modelling) to predict which shorelines may be impacted by oil, time to impact, probability and quantity of oil to shore. Priority coastline sections are compared with the shorelines that are predicted to be oiled and available tactical plans are activated.
Analysis of aerial observation and current situational awareness	Planning Chief and Environment Unit Leader to use aerial surveillance data, information gathered by the Situation Unit and the protection priorities identified in pre-spill planning as a starting point for shoreline surveys and cleanup activities.
SIMA	Priority of the implementation of tasks to support this strategy will be focused on cleaning oil from shorelines with the highest environmental sensitivities. Planning Chief and Environment Unit leader to determine where the optimal mitigation outcomes will be achieved through shoreline cleanup activities. This analysis will require information gathered by shoreline assessment field teams, and consulting with WA DoT representatives to confirm protection priorities.

Task	Guidance
	Shorelines will be assessed for the extent of the oiling, with this information reported back to the VOGA ICT to determine which shoreline(s) is/are the priority for cleanup. This determination will be made based on the preparatory SIMA, and the SIMA that will be undertaken at the time by the Planning Unit within the ICT. Shoreline cleanup will follow a three-stage methodology (refer to ITOPF Technical Information Paper No. 7): 1. Emergency phase – collection of oil floating close to the shore and pooled bulk oil removal. 2. Project phase – removal of stranded oil and oiled shoreline material that cannot be cleaned in-situ. 3. Polishing phase – final cleanup of light oil contamination and removal of oil stains, where the incident SIMA demonstrates this is necessary. Actual cleanup tasks for each of the three stages will be selected based on an assessment of suitability for the cleanup task for the oil character and shoreline type. Where trajectory modelling indicates likely multiple strandings of oil, and a SIMA indicates no likely worse outcome, shores may be left to recover without intervention. In undertaking this three-step process, VOGA contractors, employees and support agencies will work to effectively and efficiently clean shorelines where possible. A number of technical guidance notes exist for shoreline assessment and cleanup operations. These include the Environment Canada SCAT Guidelines (2007), the POSOW Shoreline Cleanup Guidelines, the UK SCAT Manual (Moore, 2004), and the WA DoT Oiled Shoreline Field Book.
Deploy shoreline cleanup teams	Deploy 8 shoreline clean up teams by Day 4 to priority coastline sections verified by the SCAT survey, SIMA and OSTM analyses. One trained shoreline team leader and ten shoreline clean up workers per team. By day 20 have a total of 100 shoreline cleanup teams ready for deployment.
Logistics	Logistics Chief activate resources in Logistics Management Plan [VOG-7000-RH-0008]. Finance Chief to ensure that personnel records are completed.
Induction and training	Operations Chief to ensure that shoreline teams are informed of how to minimise damage to flora and avoid encounters with fauna. Induction and training of onshore teams accessing to uninhabited islands to include that spill response teams should avoid disruption of environment and take practical tactical precautions to avoid contact with flora and fauna. The number of staff and teams required will vary according to the sensitivities being protected. Operations Chief to also ensure the waste management plan prepared by Planning and Logistics is implemented on site.
Marine vessel transport of people and equipment	Logistics Chief to secure marine vessel(s) capable of carrying crew and spill equipment to remote islands.
Aerial surveillance and/or transport	Logistics Chief to secure aircraft to enable ongoing aerial surveillance of shorelines and/or transport of people and equipment.
Equipment	Cleaning equipment, decontamination set. The type and amount of equipment required for shoreline cleanup will depend on the technique used) and operational constraints such as access to the shoreline and weather conditions. Equipment held in the State stockpiles (DoT) is suitable for shoreline cleanup activities as well as the equipment held in AMOSC and AMSA stockpiles. Additional resources can be accessed from OSRL.

Task	Guidance
Ongoing cleanup operations	Planning Chief and Operations Chief decide in each IAP cycle which shorelines are to be cleaned and the cleanup method to be used. The decision to use particular cleanup methods will be based on the information provided by the SCAT teams and operational teams working the shorelines. Shoreline cleanup, subject to amenable weather conditions and access, is the use of a variety of cleanup methods on shorelines to remove stranded hydrocarbons, and to minimise the potential ongoing environmental damage caused by those hydrocarbons. Priority of the implementation of tasks to support this strategy will be focused on cleaning oil from shorelines with the highest environmental sensitivities. Shoreline cleanup teams will be directed (as part of the IAP) to mount operations in areas where the optimum mitigation outcomes will be achieved. This analysis will be undertaken at the time by the Planning Team, using shoreline assessment field teams, and consulting with WA DoT representatives to confirm protection priorities. The WA DoT will be consulted in the SIMA process and response strategy selection for OSR that impacts State waters. Sorbents will not be used for shoreline cleanup on high energy shorelines. Mechanical removal and high pressure flushing will not be undertaken in mangrove areas. Water from high pressure flushing will not be directed in between rocks and onto sediment.
Waste collection and transport	Where shoreline cleanup is occurring, VOGA will implement the establishment of hot, warm and cold zones, to minimise secondary contamination. Local sites will be used for the temporary storage of soiled material, liquid waste and solid waste/oil mixes, to enable appropriate final waste solution to be effectively implemented. Shoreline waste generation can be reduced by identifying shorelines likely to be impacted and pre-cleaning the shore of debris and vegetation before oil strands, thus reducing the total amount of oily waste to dispose of. Shoreline waste generation can range from three to over 10 times the amount of oil stranded. Sorbent materials will be stored in a contained storage area prior to transport and disposal to prevent any further contamination of habitats.
Incident action planning	At the completion of shoreline cleanup operations, the Planning Chief will review the operations based on a briefing from the Operations Chief and provide a recommendation to the Incident Commander for future shoreline cleanup activities.
Effectiveness guidance for response strategy	OMP6 – Shoreline assessment. OMP1 – Hydrocarbon properties and weathering behaviour at sea. Operational data collection: • Shoreline surveys undertaken • Information collected in surveys used to inform cleanup activities • Shoreline cleanup activities do not do further damage than oil alone • Waste stored and removed offsite • Shoreline cleanup endpoints agreed to and closed out by stakeholder representatives.

Table 11-16: Shoreline cleanup minimum resource requirements

Means/ Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Induction	Shoreline teams are informed of how to minimise damage to flora and avoid encounters with fauna.	1 x Trainer.	72 hours on site.	1 x Trainer.		3 x Trainers.
OMP6 SCAT	Shoreline cleanup assessement technique surveys undertaken and used to inform shoreline cleanup priorities.	10 Teams.	18 OSRL SCAT specialists, plus additional team members trained in week 1 via SCAT E-learning training course being administered via the OSM Supplementary SA.	60+ AMOSC Industry Core Group. 12 AMOSC staff trained in SCAT.		90 people (45 teams if resourced at 2 personnel per team; 30 teams if resourced at 3 personnel per team).
Manual shoreline cleanup activities	Floating oil close to shore collected and pooled bulk oil removed. Stranded oil removed. Cleanup of light oil contamination (polishing phase).	8 team leaders and 80 cleanup workers (88 people) sourced and mobilised to forward operating base.	3 shoreline cleanup teams (30 workers and 3 team leaders) mobilised and on site for induction within 72 hours.	10 shoreline cleanup teams on site (110 people – 1 trained team leader, 10 workers per team).		45 team leaders and 450 workers sourced and ready to deploy to forward operating base.
Logistics	Crews are safe, fed, in contact with other parts of the response and watered.	Mobilisation of PPE, food, water, shelter, communications network.	72 hours on site.	PPE, food, water, shelter, communications network. Amenities for 110 pax.		PPE, food, water, shelter, communications network. Amenities for 495 pax.
Marine vessels	Marine vessel(s) capable of carrying crew and spill equipment to remote islands.	Marine vessels.	72 hours on site.	8 x Marine vessels to support transport of personnel, equipment and ammenities. 3 x marine vessels capable of accomodating shoreline cleanup teams working at priority island locations.		20 x Marine vessels to support transport of personnel, equipment and ammenities. Marine vessels and/or floatel capable of accomodating shoreline cleanup team members working on islands.

Means/ Task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Equipment	Cleaning equipment and decontamination set selected according to suitablity for cleanup task and shoreline type.	20 x shoreline cleanup kits made up of shovels, plastic bags, rakes, buckets, wheelbarrows. Decon kit.	72 hours on site.	80 x shoreline cleanup kits made up of shovels, plastic bags (20 kg capacity), rakes, buckets, wheelbarrows and PPE. 2 x decontamination stations (1 per operational zone) Mechanical equipment: 2 x front-end loaders for work on mainland locations. 2 x graders for work on mainland locations. 4 x skid steers. 8 x 4WD vehicles (1 per team leader).		450 x shoreline cleanup kits made up of shovels, plastic bags (20 kg capacity), rakes, buckets, wheelbarrows and PPE. 20 x decontamination stations (based on 5 operational zones and to be determined with real time data). Mechanical equipment: 10 x front-end loaders for work on mainland locations. 10 x graders for work on mainland locations. 20 x skid steers. 50 x 4WD vehicles (mainland only).
Booming systems	A system that can effectively and efficiently direct or prevent the movement of oil.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms. Crew to operate the system.	48 hours on site.	Various lengths of land/sea boom, shoreline protection booms, sorbent booms. Crew to operate the system.		Various lengths of land/sea boom, shoreline protection booms, sorbent booms. Crew to operate the system.
Waste collection, storage and transport	Short term waste collection. Long term oily waste collection based on total oil ashore for a single worst case single trajectory (Category E) 18,214 m^3 with a bulking factor of 10.	Temporary waste storage capability activated.	48 hours to marine operating base.	Temporary waste storage on site to cleanup locations for 450 m^3 oily waste per day (4,500 m^3 over 10 days). Waste transferred to intermediate storage and potentially final waste disposal.		Temporary waste storage on site to cleanup locations for 25,650 m^3 of waste collected over 157 days. Waste transferred to intermediate storage and potentially final waste disposal.

11.2.7 Oiled Wildlife Response Strategy

11.2.7.1 Wildlife First Strike Response

Table 11-17: Wildlife first strike response

Task	Guidance
Activate WAOWRP and POWRP	Call the DBCA State Duty Officer on telephone **(08) 9219 9108.** The DBCA State Duty Officer will notify an OWA. Request that local DBCA Officers are also notified. Appoint a Wildlife Division Coordinator. First strike response activities may be undertaken within the Environment Unit of the Planning section until a Wildlife Division Coordinator is actually in the ICC.
Rapidly assess the situation	Review OSTM – both the model used in response planning and the real time when available. SITREP – reports of wildlife both oiled and active within the response area.
Provide advice to the IMT in relation to the wildlife assets at risk	Wildlife Division Coordinator to undertake. Use POWRP to identify wildlife assets at risk, cross reference with wildlife information contained in SIMA.
Determine the response level	Likley to be OWR Level 6.
Liaise with Oiled Wildlife Advisor	Wildlife Division Coordinator to liaise with OWA.
Gather information from POWRP	Wildlife specific for POWRP operational sectors 7 to 12 initially, then most appropriate operational sectors between days 10 and 20.
Activate first strike response kits	Wildlife Division Coordinator and OWA discuss get approval from IC. First strike kits are portable and contain equipment to allow stabilisation of wildlife before triage and possible treatment at an oiled wildlife facility. Refer to Table 3 of the POWRP for kit location and access details.

11.2.7.2 Mobilisation of Resources

Table 11-18: Mobilisation of resources

Task	Guidance
Personnel	Activate and mobilise a Wildlife Operations Coordinator to Dampier.
	Activate the AMOSC OWR Industry Team
	DBCA volunteer database – access through DBCA Duty Officer.
	Labour Hire – source personnel with the following skill sets/abilities: • Work away from home. • Work with animals. • Work in remote locations. • Medically fit. Source unskilled personnel (OWR skill level 1), mobilise to Dampier and conduct induction process and basic training developed by DBCA.
Equipment	Containers for OWR facilities – Dampier to be set up first to service POWRP operational sectors 7 to 12. Planning to be undertaken for staging sites in various locations in addition to holding centres and/or oiled wildlife facilities (small, medium or large) for Exmouth, Onslow or Port Hedland between days 10 and 20 and Broome beyond day 20. To be confirmed by OSTM and the SIMA process at the time of the spill.
	Support mobilisation of first strike response kits to priority shoreline staging areas (Table 7-7).

11.2.7.3 Wildlife Reconnaissance

Table 11-19: Wildlife reconnaissance

Task	Guidance
Reconnaissance across priority shorelines between Ashburton and De Grey River Mouth prior to Day 10, with specific locations determined by OSTM and the initial SIMA at the time of the spill. Resources are required to identify and record location of oiled wildlife as well as determining the presence of wildlife in areas predicted to be impacted by oil. Real time wildlife reconnaissance is necessary to ground truth information contained in the POWRP due to seasonal and inter-annual variation in abundance and distribution of wildlife.	
Aerial reconnaissance	• Aerial reconnaissance will be highly beneficial to identify concentrations of wildlife that can then be targeted by foot or boat. • Where possible, combine the aerial surveillance activities undertaken in monitor and evaluate to gain situational awareness of wildlife that has been oiled or is likely to be oiled. • Need to emphasise data flows – make sure the information gathered is shared within the ICT for the IAP and OSMP activities. • Oiled wildlife specific reconnaissance of known habitats and of shoreline that is predicted to be impacted to identify potential for pre-emptive action.
Marine reconnaissance	• Vessel-based reconnaissance will be required for islands and mangroves in POWRP Operational Sectors 6 to 14.
Shoreline reconnaissance	• For stretches of sandy beach, reconnaissance can be conducted by ATV or 4WD. In areas where beach access is not possible via vehicle (i.e. cliffs), reconnaissance by foot will be required. • All coastal access by vehicles on Barrow Island is forbidden unless approval is granted by DBCA. • See notes regarding access of personnel to Barrow Island – quarantine and induction requirements.

Table 11-20: OWR minimum resources

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
First strike response, mobilisation of resources and wildlife reconnaissance (OWR Stages 1-3)						
Wildlife first strike response	WAOWRP and the POWRP are activated.	N/A – activation task only.	Once OPP1 or OPP2 is activated.	N/A – activation task only.	N/A – activation task only.	N/A – activation task only.
	OWA and Wildlife Division Coordinator are activated and assigned to the ICT.	1 x OWA. 1 x OWR Division Coordinator.	Once WAOWRP is activated.	N/A – activation task only.	N/A – activation task only.	N/A – activation task only.
OMP5 Marine fauna assessment	Rapid assessment of presence and distribution of marine fauna; evaluate impact of spill and response activities on fauna.	1 x Aerial team	Once OPP1 or OPP2 is activated.	1 x aerial team minimum .		

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Mobilisation of resources	First strike response kits are mobilised to staging areas within the POWRP operational sectors 7 to 12.	Vehicles/small trucks to deliver 6 x first strike response kits to operational sectors. Vessels/aircraft to take kits to islands. 1 x OWA. 1 x OWR Division Coordinator.	Within 24 hours.	Mobilisation for Dampier. 1 x OWA. 1 x OWR Division Coordinator.	Mobilisation for between North West Cape and Eighty Mile Beach. 1 x OWA. 1 x OWR Division Coordinator.	Mobilisation for Eighty Mile Beach to Broome area if applicable - Activation of Kimberley OWRP if required (sectors 1 and 2). 1 x OWA. 1 x OWR Division Coordinator.
	Two OWR containers are mobilised to an OWR facility location in Dampier.	2 x OWR containers from Dampier (AMSA) and Fremantle (AMOSC).	Within 24 hours.	2 x OWR containers deployed to Dampier OWR facility.	N/A – containers deployed.	N/A – containers deployed.
Wildlife reconnaissance across POWRP Operational Sectors 7 – 12.	Information contained in POWRP and SIMA is ground truthed. Situational awareness regarding wildlife that has been oiled and wildlife present within the path of the spill trajectory is gained.	1 x aerial observation over extent of spill combined with Monitor and Evaluate tasks. 1 x aerial observation over extent of predicted trajectory requires 1 x aircraft. Aerial survey: 1 x observer; 1 x aircraft; 1 x aerial support base for the task. Utilise aerial spill surveillance aircraft and personnel if none available specifically for oiled wildlife reconnaissance.	Concurrently with monitor and evaluate activities. Wildlife specific reconnaissance within 24 hours.	Aerial survey: 2 x observer; 1 x aircraft (fixed wing or helicopter); 1 x aerial support base for task. Boat based survey: 1 x small vessel (<12 m length) 1 x boat driver; 2 x crew Shoreline survey: 2 x Quad motorbike or 4WD vehicle; 4 x survey crew. 8 x additional team members.	Aerial survey: 2 x observer; 1 x aircraft (fixed wing or helicopter); 1 x aerial support base for task. Boat based survey: 1 x small vessel (<12 m length); 1 x boat driver; 2 x crew. Shoreline survey: 2 x Quad motorbike or 4WD vehicle; 4 x survey crew. 8 x additional team members.	Aerial survey: 2 x observer; 1 x aircraft (fixed wing or helicopter); 1 x aerial support base for task. Boat based survey: 1 x small vessel (<12 m length); 1 x boat driver; 2 x crew. Shoreline survey: 2 x Quad motorbike or 4WD vehicle; 4 x survey crew. 8 x additional team members.
First strike response, mobilisation of resources and wildlife reconnaissance (OWR Stages 4-8)						
IAP wildlife sub-plan development	Future OWR activities arrangement developed based on the spill scenario.	1 x OWR Advisor; 1 x OWR Planning officer; 1 x OWR Division Coordinator.	Within 48 hours.	12 x personnel.	12 x personnel.	12 x personnel.

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Wildlife rescue and staging	OWR rescue operations should determine the best combination of pre-emptive capture, hazing and the collection and management of oiled wildlife based on resources available. Begin establishing staging site as a logistic base for search and capture teams. Staging areas to be set up in POWRP operational sectors 7 to 12. Then in most appropriate operational sectors between North West cape and Eighty Mile Beach in Day 10–15.	Boat based collection/hazing: 1 x small vessel (<12 m length); 1 x boat driver; 2 x crew; 2 x capture nets; 10 x cages (depending on vessel deck space and type of oiled wildlife encountered – seabirds are most likely in this timeframe).	Within 72 hours.	Boat based collection/ hazing: 1 x vessel (<12 m length); 1 x boat driver; 4 x crew; 4 x capture nets; 50 x cages. Staging site: 1 x OWR Kits (AMSA/ AMOSC). 25 x personnel.	Boat based collection/ hazing: 1 x small vessel (<12 m length); 1 x boat driver; 2 x crew; 2 x capture nets; 10 x cages. Staging site(s): 2 x OWR kits (AMSA/ AMOSC) 25 x personnel.	Boat based collection/ hazing: 1 x small vessel (<12 m length); 1 x boat driver; 2 x crew; 2 x capture nets; 10 x cages. Staging site(s): 2 x OWR kits (AMSA/ AMOSC). 25 x personnel.
Establishment of an oiled wildlife facility	Establish and manage OWR Facility in Dampier and Exmouth or Port Hedland.	1 x Suitable area for facility pre-identified/analysed for suitability, i.e. Dampier Sharks Football Club (Pilbara OWRP) or Windy Ridge Oval and Facilities; 2 x OWR containers; existing built facilities or temporarily erected/installed structures, i.e. marquees (at least 4 m x 4 m), mobile site offices; shower and toilet facilities; laundry facilities or contactor to outsource laundering; resources and equipment as listed in the WAOWRP.	Within 3–4 days for Dampier, Montebello Islands or Barrow Island.	Mobilise resources for oiled wildlife facility. 18 x personnel.	Oiled wildlife facility set up by Day 10. 18 x personnel.	Dampier and additional OWR facility operating resources. 18 x personnel.

Means/task	Outcomes	Minimum resources required for first 48 hours	Timeframe (on spill notification)	5 days	10 days	20 days
Wildlife rehabilitation	OWA and OWR Planning officer to gather information on the spill to gauge potential wildlife impacts and therefore long-term rehabilitation requirements. Incorporates OSMP scientific monitoring tasks specific to oiled wildlife.	1 x OWR Planning officer; 1 x OWR Division Coordinator. Activation of OSMP oiled wildlife contractor.	By Day 5.	1 x OWR Planning officer; 1 x OWR Division Coordinator. 56 x personnel. Maintenance of OSMP oiled wildlife contractor.	1 x OWR Planning officer; 1 x OWR Division Coordinator. 56 x personnel. Maintenance of OSMP oiled wildlife contractor.	1 x OWR Planning officer; 1 x OWR Division Coordinator. 56 x personnel. Maintenance of OSMP oiled wildlife contractor.
Oiled wildlife termination	Oiled wildlife rescue and rehabilitation of animals is completed. Establish a demob team to ensure all records are forwarded to the logistics section for processing, all facilities are decontaminated, stocks replenished, all waste is removed and all wildlife still in care is transferred to a suitable wildlife rehabilitation facility, i.e. Perth Zoo.	N/A	By Day 10.	N/A	4 x personnel for the demob team plus labour if required.	4 x personnel for the demob team plus labour if required.

Section 12 – Termination and Recovery

12.1 Response Strategies Termination Criteria

Consistent with the National Plan, VOGA's priority in a response to an oil spill incident is human health and safety, meaning that response activities will cease if operations cannot be carried out in a manner that do not present unmanageable risks to human safety.

Termination criteria will aid the decision to terminate OSR activities for each strategy. Note that these termination criteria only apply if the strategy is able to be operationally implemented (e.g. the weather conditions allow marine/aerial operations to take place).

Response strategies are monitored throughout implementation and the following considerations are taken into account (in addition to safety issues) when determining if a response strategy is lowering impacts to ALARP:

- Measures are no longer effective
- Further cleanup is likely to cause greater environmental damage (SIMA)
- The level of response is out of proportion to the amount of oil on the water
- When the costs of the response are exceeding the likely benefits, i.e. the point of diminishing returns is reached in terms of monetary costs.

As per the spill response planning process outlined in Figure 3-1, the operational SIMA provides guidance to the identification of termination criteria, by assessing if the:

- Response strategy reduces the probability of impact of to the sensitive receptors
- Response strategy increases the number of days before impact to the sensitive receptors
- Response strategy reduces the average and/or total amount of oil to impact the sensitive receptors
- Response operation has more of a negative impact than untreated oil
- Controls that are put in place to mitigate impacts associated with the proposed response strategy.

If risks associated with the response strategy are aligned with the Well Exploration EP, then KPIs (effectiveness measures which inform termination criteria) are developed, response strategies implemented and assessed. If termination criteria are met then the response strategy ceases. Table 12-1 presents termination criteria that can be used in the spill response planning process (IAP process). Shoreline cleanup termination criteria are explained in more detail separately because of the complexity that maybe present in a shoreline response (Table 12-2).

Table 12-1: Termination criteria

OSR strategy	Termination criteria for each OSR strategy
Monitor and evaluate	The spill is no longer visible to human observers. Specifically, a 'silvery/grey' sheen, as defined by the Bonn Agreement Oil Appearance Code (BAOAC), is no longer observable. Modelling will continue until response modelling predicts oil concentrations in the environment due to the spill are below contact threshold concentrations of 10 g/m^2 surface oil, 100 ppb entrained oil and 50 ppb dissolved aromatic hydrocarbons. When operational monitoring undertaken to evaluate effectiveness of response strategies is no longer required.
Chemical dispersion	Chemical dispersant activities will cease if the SIMA output demonstrates that the response strategy: • Does not reduce the probability of oil impacting sensitive receptors • Does not increase the number of days to impact sensitive receptors • Does not decrease the volume of oil to impact sensitive receptors • Has more of a negative impact on sensitive receptors than the untreated oil (e.g. impact of entrained oil), or • Hazard controls put in place are not achievable.
Containment and recover	Weir skimmers are recovering <10% hydrocarbon by volume, oleophilic skimmers are recovering <50% hydrocarbon by volume, entrapment in booms is no longer effective, or the observed trajectory of the oil indicates that it is heading away from sensitive receptors.
Mechanical dispersion	Oil is not observed to be effectively dispersed into the water column. The spill is no longer visible to human observers. Specifically, a 'silvery/grey' sheen, as defined by the BAOAC, is no longer observable.
Protect and deflect	Booms are unable to be deployed because of safety concerns or sea state and weather prevents effective deployment of equipment. The spill is no longer visible to human observers. Specifically, a 'silvery/grey' sheen, as defined by the BAOAC, is no longer observable.
Shoreline cleanup	Termination criteria for shoreline cleanup activities is site dependant and will be based on scientific advice that suggests further cleanup activities are unlikely to materially decrease lasting hydrocarbon impacts on environmental sensitivities. Termination points are likely to be selected based on the general cleanup objectives, which are to: • minimise exposure hazards for human health • speed recovery of impacted areas if possible • reduce the threat of additional or prolonged natural resource impacts. Table 12-1 provides some examples of how shoreline clean-up termination points can be described. WA shorelines are within the jurisdiction of the WA State Government, the decision to cease shoreline cleanup will be made with advice from the WA DoT to take into account the State ESC position. Shoreline cleanup activities will cease if a safe working environment is not present for responders.
Oiled wildlife	Termination criteria for OWR is dependent on the incident and will be based on the termination criteria descirbed in Stage 8 of the WAOWRP.

12.1.1 Shoreline Termination Criteria

Due to the site and spill-specific nature of shoreline cleanup, termination points are developed for the specific incident, however, there are some guiding principles that VOGA will consider when working with the State ESC and stakeholders to identify termination points.

Termination points, also known as end points for shoreline cleanup, are likely to be selected based on the general cleanup objectives, which are to:

- Minimise exposure hazards for human health
- Speed recovery of impacted areas if possible
- Reduce the threat of additional or prolonged natural resource impacts.

These objectives lead to developing cleanup strategies and end points that do not cause more harm to the environment than good (Oil Spill Response, 2011).

Ideally, cleanup efforts will return the resource to its baseline condition without suffering further impact or affecting other resources. Aggressive and inappropriate cleanup techniques can make matters worse. Less intrusive methods or natural recovery are often preferable. The best cleanup strategy is often not the one that removes the most oil; rather, it is the strategy that removes oil that poses a greater risk of injury than would result from cleanup, and allows remaining oil to be removed by natural processes.

The Environment Unit within the Planning Section will provide the following in regards to shoreline cleanup:

- Guide the Operations Section in conducting specific cleanup methods to minimise adverse environmental impact (best management practices).
- Provide the Operations Section with environmental and safety constraints on conducting cleanup activities in specific habitats.
- Develop spill-specific cleanup objectives, guidelines and termination points. This will require input from the State ESC because the DoT is the Control Agency and jurisdictional authority for OSR in State waters. Examples for shoreline cleanup that may be used as the basis for developing the spill-specific cleanup termination points with the State ESC are described in Table 12-2.
- Identify time-critical and degree-of-use issues to be combined with cleanup priorities and end points.
- Identify sensitive resources that may be adversely affected by the proposed treatment methods (e.g. rich intertidal biota on rocky shores where low pressure ambient water flushing will be used).

Table 12-2: Shoreline clean-up termination points

No oil observed: not detectable by sight, smell, feel	• This end point is often used for sand beaches where oil removal can be effective without delaying resource recovery. • Visual inspections are preferred over chemical analysis of samples because of: difficulty of sampling areas with high variability; time and costs to complete sampling and analysis; and lack of guidelines on what levels are safe.
Visible oil but no more than background	• This termination point is often applied where there is a significant background rate of tar ball deposition on the shoreline.
No longer generates sheens that will affect sensitive areas, wildlife, or human health	• This termination point is used where sheening persists after cleanup efforts become ineffective, or on sensitive habitats where further cleanup efforts will cause more harm than natural removal. Residual sheening should persist over a relatively short time period. • Sheen is an oil film ranging from barely visible to dull colours. Sorbents effectiveness is usually limited in recovery of sheens. Consider the amount and duration of sheening, and the distance to sensitive resources, to determine if sheening poses a significant threat. • Consider the degree of exposure: high wave/tidal exposure speeds removal and breaks up sheens; sheltered areas will sheen longer and sheens will be more persistent. • Consider the degree and timing of use: sheening may be tolerated in areas or during periods of low use; even minor sheens may not be tolerated in areas of high use, such as swimming beaches.
No longer rubs off on contact	• This termination point is usually defined as oil removal to a stain or coat, or weathering to the point that it is no longer sticky. It is applied to hard substrates (rocky shores, seawalls, riprap, and gravel) and vegetation (marshes, mangroves). • The objective is to prevent oiling of fur, feathers, and feet of wildlife, and oiling of people and property during contact with oiled surfaces. • Consider the degree and timing of use: high-use areas often require higher cleanliness, whereas natural removal is allowed in low-use areas where further cleanup efforts will be disruptive.
Oil removal to allow recovery/re-colonisation without causing more harm than natural removal of oil residues	• This termination point is used where further oil removal will result in excessive habitat disruption (e.g. trampling of soft sediments and plant roots, mixing oil deeper, extensive sediment removal, vegetation cutting) or high biota mortality (e.g. from high-pressure, hot-water washing of intertidal communities). • It is also used for areas with difficult access, which limits the type of cleanup that can be conducted along that shoreline segment. • Consider the potential for erosion from excessive sediment removal, particularly where erosion/deposition patterns of the beach cycle will rework and clean sediments within an acceptable timeframe.

12.2 Relevant Person Engagement in Termination

Community and relevant person understandings and expectations will play a role in both the decision to terminate a response and the acceptability of the decision. Consultation with these groups will be undertaken by VOGA prior to any termination decisions being implemented.

12.3 Post-response Recovery

Following termination of the incident response, VOGA will undertake an investigation to identify any ongoing impacts to the environment or communities, and provide a coordinated plan for addressing these impacts. A debriefing and post-incident analysis will be undertaken with responders and stakeholders, to identify any improvements to this plan as appropriate.

Section 13 – Incident Command Team (ICT) Arrangements

13.1 ICT Personnel

Arrangements and plan for full-scale activation of ICT resources is provided in Table 13-1. Activation plan is based on OPP2 requirements. During the early stages of a spill response the plan should be validated to ensure appropriate ICT support is provided to in-field operations. For activation of OPP1, the Planning Chief is responsible for reviewing and adjusting the activation plan in Table 13-1.

Key assumptions of the activation plan are:

- The ICT will run for 24 hours a day for up to 10 days before transitioning to a sustainable model as defined by the planning team.
- The ICT shifts will be staggered with Operations and Logistics functions operating 0500 to 1700 and the Planning, Incident Command, and Finance functions operating 0800 to 2000.
- A skeleton crew of 3 will staff the ICT overnight, between 2000 and 0500, in Perth. Night shift consists of Incident commander, administrator and situation unit.
- Vermilion's international associated companies providing ICT staffing remotely overnight.
- The ICT team size should be fit-for-purpose considering:
  - that the span of control should not exceed more than 7 direct reports within the ICT itself
  - that the workload can be spread across other individuals on an as needs basis because the training standards in critical roles are the same
  - the Incident Commander and Section Chief roles are identified as critical to a successful response and must be filled within 12 hours of activation
  - the Incident Commander must have current competence training in PMAOMIR418 and oil spill response to undertake their role
  - the Planning/Logistics/Operations Sections Chiefs must have current competence training in PMAOMIR322 and oil spill response to undertake their role.
- A time-on/time-off roster should be established no earlier than day 7 for continuity of response and no later than day 10 to manage fatigue. Table 13-1 assumes roster change occurs on day 5.
- The response is expected to reach a 'steady state' by day 20, meaning that detailed plans for day 20 to spill termination should be in place by day 20.

The competence and quantity of staff required to successfully respond to a hydrocarbon spill has leveraged off the detailed planning in OPP1 and OPP2, the initial IAP in place for these events. Further, the VOGA response systems, other response plans (e.g. the Logistics Plan and

the OSM BIP) are in place to assist all ICT personnel, particularly in the early stages of a response.

VOGA has the capability to staff an ICT with appropriately trained and competent personnel, to meet the basic resource requirements of an ICT within an hour or full activation within 48 hours. VOGA maintains trained onshore personnel for ICT roles with each core role being assigned between 2 and 5 personnel who can fill the role or support it in an extended ICT. Personnel from the Wandoo facilities (off rostered, and then on-site personnel if conditions enable this) would be available to provide personnel to the IMT within between 48 and 96 hours.

ICT roles can be staffed from any of the following sources:

- VOGA local staff and contractors. Personnel who are required to be available within 12 hours are 'on roster'
- Vermilion International staff (some roles can be filled remotely)
- Consultants (usually with Master Service Arrangements in place)
- Semi-skilled contractors (temporary contract hires)
- AMOSC Staff: Under the AMOSC Service Agreement, AMOSC can provide Industry Liaison Officer
- AMOSC Staff and Core Group: Under the AMOSC Service Agreement and Response Plan, Vermilion is able to scope specific response activities to AMOSC and as such AMOSC are able provide resources as outlined in Table 13-1 through their response structure; this includes support from WA DoT.

Table 13-2 provides a minimum resource and competency requirements by source to enable the resource plan in Table 13-1 to be achieved. VOGA manages our business and capability arrangements to ensure we have sufficient contingency, through training majority of office staff and managing leave; ensuring we have sufficient capacity to maintain access to VOGA numbers as outlined Table 13-2.

In addition, under the National Plan, a National Response Team (NRT), comprising experienced personnel from operator to senior response manager level from Commonwealth/State/NT agencies, industry and other organisations, has been developed. The services of the NRT will be obtained through the Environment Protection Group and AMSA for the release of designated personnel for OSR activities. Personnel resources from these sources have not been included in the estimates of personnel available because they are likely to be deployed by AMSA/WA DoT to support the government response.

Further highly trained staff from OSRL and the Global Response Network can be called upon to staff ICT roles either remotely or later in the response. Personnel resources from these sources have not been included in the estimates of personnel available to ensure surge capability is available.

VOGA has prepared an induction package to enable third party ICT members to gain adequate knowledge of the specific VOGA oil spill arrangements.

13.2 Response Facilities

VOGA's ICT utilise VOGA's Perth office as the primary Incident Command Centre (ICC) for OSR monitoring or incident management activities.

This facility contains information communication technology infrastructure to communicate effectively with the range of parties required in a significant response, private and nearby break out areas, along with sufficient access controls and logistical support for the ICT to operate over a number of weeks or months. In the event a unified command ICT is established with the DoT, a co-located ICC will be established at mutually agreed location.

VOGA also has access to an alternate ICC should a business continuity event, civil unrest, security or capacity issue impede VOGA's capability to fully exercise incident control from the primary facility.

For spills requiring significant field logistical support, a forward operating command area will be located as close as possible to the spill site, most likely within the Port of Dampier (Pilbara Ports Authority), with this team operating from the Port of Dampier administration building, MoF Road Dampier and the port area.

In addition, depending on spill size a forward operating post may be established. The most likely location will be at the supply base near the Port of Dampier. VOGA has arrangements in place with a logistics company to provide forward base and logistical services in Dampier in the event of an oil spill.

13.2.1 ICT Resources and Activation Plan

Table 13-1: ICT resources and activation plan

ICT	Role	Task/Function	Competence		Response arrangement		Total ICT resource need over time				
							Day 1	Day 2	Day 5	Day 10	Day 20
			Skill and attribute assessment	Additional training or experience or qualification required	Source	Immediate need/timeliness of arrangement	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)
CCT	CC Operations Chief	Provides the interface between the ICT and CCT. Provides updates to the CCT regarding IAPs and communicates any needs for support if required. Responsible for ensuring VOGA's corporate objectives are communicated to the ICT and are also reflected in the IAP.	Experience to attain role is sufficient to perform role	Nil	VOGA Local	Within 12 hours	1	1	2	2	2
IC	Incident Commander	Maintain control responsibilities for the incident response. Provide professional OSR command to the IMT. Approve IAP and, where required, engage State Maritime Environmental Emergency Coordinator/DoT Incident Controller for agreement/endorsement of plan for activities within, or potentially impact, WA waters.	Oil spill competence gap between day-to-day role and response role	PMAOMIR418 + OSR Training or IMO Level 3	VOGA Local	Within 1 hour of activation	1	2	4	4	4
IC	Safety Officer	Assesses unsafe situations and develops measures for assuring personnel safety. Confirms safety regulatory authorities and applicable departments have been notified. Ensures implementation of safety measures and monitoring and recording of personnel exposures to hazardous products. Supports accident investigations, recommends corrective action, and prepares accident report.	Oil spill competence gap between day-to-day role and response role	PMAOMIR322 + OSR Training	VOGA Local	Within 24 hours	1	1	2	2	2
IC	Stakeholder Liaison Officer	Coordinates investigation of reportable events. Responsible for managing regulatory engagement and coordinating any regulatory approvals required to implement response strategies. Coordinates engagement of relevant persons who are impacted from the spill or response activities. Acts as the functional interface between these various parties. Implements VOGA Communications Plan, providing media information support and serving as the dissemination point for all VOGA media releases.	Oil spill competence gap between day-to-day role and response role	PMAOMIR322 + OSR Training	VOGA Local	Within 24 hours	1	1	2	2	2

ICT	Role	Task/Function	Competence		Response arrangement		Total ICT resource need over time				
							Day 1	Day 2	Day 5	Day 10	Day 20
			Skill and attribute assessment	Additional training or experience or qualification required	Source	Immediate need/timeliness of arrangement	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)
IC	Public Information Officer	Represent VOGA and provide timely information of the incident and the incident response to government stakeholders.	Full competence overlaps between day-to-day role and response role	Nil	Contractor	Within 24 hours	1	1	2	2	2
IC	Liaison Officer (Industry)	Identifies the assisting and cooperating companies and agencies, including communications link and location; provides list to the CCT. Functions as “point of contact” for assisting and cooperating agency representatives. Responsible for ensuring that parties who have agreed to undertake specific functions under the OPEP are undertaking the functions consistent with the OSR strategies, performance standards and objectives of the VOGA Wandoo Field OPEP.	Full competence overlaps between day-to-day role and response role	PMAOMIR322 + OSR Training	AMOSC Staff	Within 24 hours	1	1	2	2	2
IC	Administration Unit	Record response data in the Incident Log.	Full competence overlaps between day-to-day role and response role	Nil	VOGA Local, Contractors	Within 24 hours	1	2	4	4	4
IC	Administration Unit	Record response data in the Incident Log.	Full competence overlaps between day-to-day role and response role	Nil	Labour Hire	Day 5	0	0	20	40	60
Planning	Planning Chief	Supervises the VOGA ICT and leads the IAP process. Records and displays data for information, planning and programming, allocation and justification. Documents and maintain records of all Wandoo Offshore Installation and VOGA ICT actions. Manages critical information requirements. Coordinate and document the response Incident Action Plan (IAP) including Interfaces with State Maritime Environmental Emergency Coordinator or State Environmental and Scientific Coordinator (ESC) for input into IAP for activities impacting state waters.	Oil spill competence gap between day-to-day role and response role	PMAOMIR322 + OSR Training	VOGA Local	Within 1 hour of activation	1	1	2	2	2
Planning	Consultation Unit	Control the release of the IAP to appropriate stakeholders.	Full competence overlaps between day-to-day role and response role	Nil	Contractor	Within 48 hours	0	1	2	2	2

ICT	Role	Task/Function	Competence		Response arrangement		Total ICT resource need over time				
							Day 1	Day 2	Day 5	Day 10	Day 20
			Skill and attribute assessment	Additional training or experience or qualification required	Source	Immediate need/timeliness of arrangement	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)
Planning	Situation Unit (Day)	Collect information from the field on the incident response status and other in-field observations. Develop maps of oil spill source area, oil spill response areas, and maps of location of response assets for inclusion in IAPs and for communication with response stakeholders (Common Operating Pictures).	Oil spill competence gap between day-to-day role and response role	PMAOMIR322 + OSR Training	VOGA Local	Within 12 hours	1	2	2	2	2
Planning	Situation Unit (Night)	Collect information from the field on the incident response status and other in-field observations. Develop maps of oil spill source area, oil spill response areas, and maps of location of response assets for inclusion in IAPs and for communication with response stakeholders (Common Operating Pictures).	Oil spill competence gap between day-to-day role and response role.	PMAOMIR322 + OSR Training or IMO 2	OSRL or AMOSC	Within 24 hours	0	2	2	2	2
Planning	Environment Unit (Lead)	Manage scientific monitoring activities and any required oiled wildlife response. Conducts net environmental benefit/impact assessments. Responsible for the collection and collation of environment data/advice, e.g. obtains environmental data from OSRA and scientific monitoring (DoT ESC and local sources) with support from Environment Unit Lead (EUL) role. Deploy and control scientific monitoring activities	EUL – potential gap	EUL – bachelor's degree in environmental management/ science; >5 years' experience in environmental management; PMAOMIR322 or IMO 2; Unit – nil (as per contract)	EUL – VOGA local or consultant	EUL - within 24 hours	1	1	2	2	2
Planning	Environment Unit	Manage scientific monitoring activities and any required oiled wildlife response. Conducts net environmental benefit/impact assessments. Responsible for the collection and collation of environment data/advice, e.g. obtains environmental data from OSRA and scientific monitoring (DoT ESC and local sources) with support from EUL role. Deploy and control scientific monitoring activities	Contracted in expertise	Bachelor's degree in environmental management/ science; >5 years' experience in environmental management	Contractor/ Consultants	Within 48 hours	0	3	8	13	16
Planning	Monitoring Coordination Team	Final approval of monitoring scopes of work. Coordinates the oil spill standby and response services. Determine when initiation and termination criteria are met.	Contracted in expertise	Nil – as per contract	Consultants	Within 48 hours	0	2	4	4	4

ICT	Role	Task/Function	Competence		Response arrangement		Total ICT resource need over time				
							Day 1	Day 2	Day 5	Day 10	Day 20
			Skill and attribute assessment	Additional training or experience or qualification required	Source	Immediate need/timeliness of arrangement	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)
Logistics	Logistics Chief	Activate and deploy PT assets and resources to the response. Activate PT supply contracts for the response. Liaison with combat agencies; industry, including adjacent operators and contractors. Responsible for establishing any Simultaneous Operations (SIMOPS) Plan to manage the risk generated by multiple activities. Develops logistics plan to support operations and provides overall resource support to emergency incident sites.	Oil spill competence gap between day-to-day role and response role	PMAOMIR322 + OSR Training	VOGA Local	Within 1 hour of activation	1	1	2	2	2
Logistics	Communications Unit	Provide input into the acquisition, installation and maintenance of communications equipment. Assist the Planning Section to produce the Communications Plan for the effective use of incident communications equipment and facilities; installation and testing of communications equipment; supervision of the Incident Communications Centre; distribution of communications equipment to incident personnel; and the maintenance of communications equipment.	Full competence overlaps between day-to-day role and response role	Nil	Contractor	Within 48 hours	0	1	2	2	2
Logistics	Procurement Unit	The Procurement Unit acquires and distributes equipment and materials for infrastructure support. Ensures supplies are appropriately stored and maintained. Obtain extra resources (people, vehicles, equipment etc.) as required. Includes supporting the incident with the provision of food and drinks to personnel involved in the incident across the ICC and all on-ground sites across different mealtimes and duty shifts (considering specific dietary requirements).	Full competence overlaps between day-to-day role and response role	Nil	VOGA International	Within 48 hours	0	1	6	6	6

ICT	Role	Task/Function	Competence		Response arrangement		Total ICT resource need over time				
							Day 1	Day 2	Day 5	Day 10	Day 20
			Skill and attribute assessment	Additional training or experience or qualification required	Source	Immediate need/timeliness of arrangement	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)
Logistics	Services Unit	Obtains and manages the necessary facilities and accommodation to support operations and incident control and maintains them in working order. Responsible for the setup, maintenance and demobilisation of incident facilities, e.g. base, ICC and staging areas, as well as security services required to support incident operations. Provides sleeping and sanitation facilities for incident personnel and manages Base operations. Each facility is assigned a manager who reports to the facilities unit leader and is responsible for managing the operation of the facility.	Full competence overlaps between day-to-day role and response role	Nil	VOGA International	Within 48 hours	0	1	4	4	4
Logistics	Transport Unit	Responsible for providing transport for personnel, equipment, supplies and food, together with fuelling, mechanical maintenance and security of all equipment and vehicles at the incident. Develop and implement a Traffic Management Plan for in and around the incident.	Full competence overlaps between day-to-day role and response role	Nil	VOGA International	Within 48 hours	0	1	4	4	4
Logistics	Resource Unit	This function gathers, maintains and presents information on incident resources and contributes to the plans for demobilisation. The Resource Unit is responsible for maintaining the status of all assigned tactical resources and personnel at an incident.	Full competence overlaps between day-to-day role and response role	Nil	VOGA International	Within 48 hours	0	1	4	4	4
Operations	Operations Chief	Implement appropriate OSR strategies. Provide communication link in the IMT Incident Command Centre (ICC) with the field response. Control the field-based response activities in collaboration with WA DoT as required.	Oil spill competence gap between day-to-day role and response role	PMAOMIR322 + OSR Training	VOGA Local	Within 3 hours of activation	1	1	2	2	2
Operations	Marine Unit	Provide IMT management of marine activities.	Full competence overlaps between day-to-day role and response role	Nil	AMOSC Core Group	Within 48 hours	0	2	4	8	12
Operations	Shoreline Unit	Provide IMT management of shoreline activities.	Full competence overlaps between day-to-day role and response role	Nil	AMOSC Core Group	Within 48 hours	0	1	2	2	2
Operations	Aviation Unit	Provide IMT management of aviation activities.	Full competence overlaps between day-to-day role and response role	Nil	AMOSC Core Group	Within 48 hours	0	2	2	4	4

ICT	Role	Task/Function	Competence		Response arrangement		Total ICT resource need over time				
							Day 1	Day 2	Day 5	Day 10	Day 20
			Skill and attribute assessment	Additional training or experience or qualification required	Source	Immediate need/timeliness of arrangement	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)	Required/ Need (FTE)
Operations	Waste Management Unit	Work with State Control Agency to support oil spill waste management (DoT and DER).	Full competence overlaps between day-to-day role and response role	Nil	AMOSC Core Group	Within 48 hours	0	2	4	4	4
Operations	Wildlife Unit	Work with State Control Agency to support oil wildlife response (DBCA).	Full competence overlaps between day-to-day role and response role	Nil	AMOSC Staff	Within 48 hours	0	1	2	2	2
Finance	Finance Chief	Provides monetary, insurance, legal, risk and human resources, related administrative functions to support emergency operations and to preserve vital records documenting work performed and associated costs in the event of disaster or major emergency.	Full competence overlaps between day-to-day role and response role	Nil	VOGA Local/ International	Within 24 hours	1	1	2	2	2
Finance	Finance Unit	Monitor and record the ongoing costs of the response and access PT funds to pay for the response.	Full competence overlaps between day-to-day role and response role	Nil	VOGA International	Within 24 hours	1	1	2	6	6
WA DOT Support	As directed by DOT	Mandated resources to support the response activities in State waters.		PMAOMIR322 + OSR Training	VOGA Local	Within 24 hours	3	3	3	3	3
WA DOT Support	As directed by DOT	Mandated resources to support the response activities in State waters.	AMOSC Core Group IMT capable persons have IMO 2 competence	Nil	AMOSC Core Group	Within 48 hours	0	4	8	8	8

Table 13-2: Minimum ICT resource and OSR training needs over time (by source)

Source and role	OSR training: arrangements during response																			
	No specific training					Core group course					PMAOMIR322 + OSR Training (or IMO 2)					PMAOMIR418 + OSR (or IMO 3)				
	Day 1	Day 2	Day 5	Day 10	Day 20	Day 1	Day 2	Day 5	Day 10	Day 20	Day 1	Day 2	Day 5	Day 10	Day 20	Day 1	Day 2	Day 5	Day 10	Day 20
AMOSC Core Group (total)						**0**	**8**	**8**	**8**	**8**	**0**	**1**	**8**	**14**	**18**					
As directed by DOT						0	8	8	8	8	-	-	-	-	-					
Aviation Unit						-	-	-	-	-	0	0	2	4	4					
Marine Unit						-	-	-	-	-	0	0	4	8	12					
Shoreline Unit						-	-	-	-	-	0	1	2	2	2					
AMOSC Staff (total)	**1**	**2**	**2**	**2**	**2**						**1**	**1**	**2**	**2**	**2**					
Liaison Officer (Industry)	1	1	2	2	2						1	1	2	2	2					
Wildlife Unit	0	1	2	2	2															
Consultants (total)	**0**	**5**	**12**	**17**	**20**															
Environment Unit	0	3	8	13	16															
Monitoring Coordination Team	0	2	4	4	4															

Source and role	OSR training: arrangements during response																			
	No specific training					Core group course					PMAOMIR322 + OSR Training (or IMO 2)					PMAOMIR418 + OSR (or IMO 3)				
	Day 1	Day 2	Day 5	Day 10	Day 20	Day 1	Day 2	Day 5	Day 10	Day 20	Day 1	Day 2	Day 5	Day 10	Day 20	Day 1	Day 2	Day 5	Day 10	Day 20
Contractor (total)	**0**	**3**	**10**	**10**	**10**															
Communications Unit	0	1	2	2	2															
Consultation Unit	0	1	2	2	2															
Public Information Officer	0	1	2	2	2															
Waste Management Unit	0	0	4	4	4															
Labour Hire (total)	**0**	**0**	**20**	**40**	**60**															
Administration Unit	0	0	20	40	60															
VOGA Local (total)											**7**	**11**	**17**	**17**	**17**	**1**	**2**	**4**	**4**	**4**
As directed by DOT											0	3	3	3	3	-	-	-	-	-
Environment Unit Lead											1	1	2	2	2	-	-	-	-	-
Incident Commander											-	-	-	-	-	1	2	4	4	4
Logistics Chief											1	1	2	2	2	-	-	-	-	-
Operations Chief											1	1	2	2	2	-	-	-	-	-
Planning Chief											1	1	2	2	2	-	-	-	-	-
Safety Officer											1	1	2	2	2	-	-	-	-	-
Stakeholder Liaison Officer											1	1	2	2	2	-	-	-	-	-
Situation Unit (Day)											1	2	2	2	2	-	-	-	-	-
VOGA Local, Contractors (total)	**1**	**7**	**24**	**24**	**24**															
Administration Unit	1	2	4	4	4															
Communications Unit	0	1	2	2	2															
Procurement Unit	0	1	6	6	6															
Resource Unit	0	1	4	4	4															
Services Unit	0	1	4	4	4															
Transport Unit	0	1	4	4	4															
VOGA Local, VOGA International (total)	**2**	**2**	**4**	**8**	**8**															
Finance Chief	1	1	2	2	2															
Finance Unit	1	1	2	6	6															
OSRL or AMOSC- Situation Unit (Night)	-	-	-	-	-	-	-	-	-	-	**0**	**2**	**2**	**2**	**2**	-	-	-	-	-
Grand Total	**12**	**16**	**70**	**99**	**122**	**0**	**8**	**8**	**8**	**8**	**8**	**15**	**29**	**35**	**39**	**1**	**2**	**4**	**4**	**4**

PART 6: Support Plans

Section 14 – Waste Management

14.1 Waste Management Strategy

The purpose of the strategy is to ensure during an OSR, VOGA:

- Engage government agencies to obtain the appropriate waste management approvals necessary for the collection and transportation of waste
- Cater for credible recovered waste during a response
- Activate the key logistic contractors for the storage, transportation and disposal of collected waste
- Ensure the collect segregation practices of waste are undertaken
- Terminate the waste management program on completion of the response.

VOGA waste management guidance for Logistics personnel is contained in VOGA's Emergency Response Logistics Management Plan [VOG-7000-RH-0008].

14.2 Waste Management Activation

Activation of the waste management plan assignments is an action step in the IAP and is the responsibility of the ICT Planning Chief for identification and ICT Logistic Chief for resource assessment and ICT Operations Chief for implementation.

Not all oil spill events will trigger a waste management activation. Once oily waste is planned to be contained or collected, then the waste management plan would be activated.

Key aspects to be acted on are:

- Assessment and decision making – determine the likely volume and types of waste likely to be collected
- Regulatory approvals – apply for DER licence to operate temporary waste storage facility and access DoT OPEP (2015) to commence the recording and waste management approval processes
- Collection/recovery/transportation/storage (intermediate and final) – activation of the Logistic Plan for activation of containment and transportation methods
- Final disposal – monitor the final disposal methods
- Termination.

14.3 Waste Management Basis

To develop a feasible waste management strategy for implementation during a response, VOGA has considered:

- DoT's OPEP (2015) Waste Management Sub-Plan
- VOGA waste contractor's capability – assessed within the OSR Capability Review [VOG-7000-RH-0009]
- WA OPEP Marine Oil Pollution Waste Management Guidelines – provides information regarding the transportation of waste and temporary storages sites including an OSRA output of potential temporary storage sites
- Decanting wastewater at sea JIP
- OSTM outputs for shoreline oiling greater than 100 g/m^2
- Environmental risks and the controls associated with waste management
- Upper credible recovery rate for spill strategies (refer Section 7.6)
- ITOPF technical papers to guide likely waste to hydrocarbon quantities ('bulking rates') associated with these strategies (refer to ITOPF Technical Information Paper 7 and 9) (ITOPF, 20144; 2014e)
- AMSA management and disposal of oily waste and debris information.

14.4 Regulatory Approvals

The waste management plan will require the support of logistics to source storage and transport options and to obtain the necessary approvals required for contaminated waste transportation and disposal.

As the temporary waste storage and treatment facilities will trigger the Category 61 thresholds within the *Environment Protection Act 1986*, a licence to operate will be required from the DER for any storage or treatment of wastes. As Works Approvals and licences can only be prescribed to specific premises, and suitable premises may not be determined until a spill has eventuated, obtaining these formal approvals is not possible in advance.

Specific regulatory approvals required or potentially required are listed in Table 14-1.

Table 14-1: Regulatory approvals for waste management activities

Approval required	Authority	Process
S75 Emergency approval for temporary waste storage	DER	1. Identification of suitable land for operations. 2. Preparation of indicative site plan and operational flowchart. 3. VOGA to request emergency approval for waste storage of DER CEO. 4. Approval granted for 14 days. 5. Further approval requested for extra 14 days if required.
Approval of temporary laydown area	DER	1. Design of temporary laydown area prepared for consultation with DER, DoT and DBCA. 2. VOGA apply for temporary licence at time of incident. 3. Required works commence. 4. Application received, and advertised in prescribed manner. 5. DER issue operating licence for lay-down area.

During offshore recovery operations, it may be beneficial as a waste reduction strategy to discharge low concentrations of oily water recovered back into the boomed area to reduce the bulking factor volume of oily water recovered.

Offshore discharges of oil in WA State waters also fall under WA *Pollution of Waters by Oil and Noxious Substances Act 1987*. If discharge of oily water becomes necessary, approval from:

- AMSA (Commonwealth waters), or
- DoT (State waters) must be obtained through submission of the MARPOL Exception Form for discharges of oily water.

14.5 Waste Practices

Waste will generally be associated from two cleanup locations:

- At-sea response operations
- Shorelines.

Table 14-2 presents a summary of the type of waste generated from these two activities:

Table 14-2: Summary of waste generated

Cleanup location	Type of waste generated
At-sea response operations	• Non contaminated organic materials (pre-impact) • Recovered oil • Contaminated water/oil in water • Contaminated containment and recovery equipment • Containment/storage equipment • Vessel hull • Contaminated PPE, sorbent • Organic and non-organic flotsam and jetsam • Animal carcasses.

Cleanup location	Type of waste generated
Shorelines	• Recovered oil • Water in oil • Contaminated substrata sand, pebbles, rocks • Organic and non-organic flotsam and jetsam • Contaminated organic material seaweed etc. • Animal carcasses • Contaminated recovery and storage equipment • Containment – 20 kg bags, drums, plastic sheeting etc. • PPE • Responders waste for habitation.

Shoreline cleanup and containment and recovery are likely to develop significant volumes of waste. However, particularly for shoreline cleanup, the amount generated will be significantly less given prudent work practices to minimise the amount of hard waste generated, and the likely impact being only a portion of the slick stranding, rather than the mass of volume assumed in shoreline cleanup waste calculations.

VOGA will leverage the waste hierarchy principles of waste reduction, reuse, recycling and disposal to minimise the amount of ultimate waste produced, thus reducing environmental and economic costs.

To reduce and manage the waste volumes during an incident, VOGA will follow, where appropriate and feasible, the work practices contained in Table 14-3.

Table 14-3: Waste minimisation work practices

Oil spill strategy	Waste minimisation work practice
Minimisation	Responder Induction to raise awareness of minimising collection or low/partial contaminated materials minimising collection or low/partial contaminated materials. At-sea operations – Decant waste water at sea as per the OSR JIP-17 and the WA Marine Oil Spill Waste Management Guidelines: • http://oilspillresponseproject.org/sites/default/files/uploads/JIP-17-Decanting.pdf • http://www.transport.wa.gov.au/mediaFiles/marine/MAC-MOP-WasteMgmtGuide.pdf Offshore and onshore – where practical access pre-impact and remove all flatsom and jetsam, miscellaneous material from water and between low-high water mark. Sort and classify waste into appropriate waste streams ASAP at source. Ensure a control on operations to comply with minimisation strategy. Consideration or washable PPE in lieu of disposals where appropriate. Early establishment of Hot and Cold areas to avoid cross contamination. Temporary storage areas are adequately contained plastic sheeting/bunds to avoid secondary contamination.

Oil spill strategy	Waste minimisation work practice
Segregation	Responders Induction on need for waste segregation on work sites to manage waste collection and temporary storage. Segregation to consider the final treatment and disposal options. Sorting waste at source. Use of multiple containers to aid segregation of waste aligned with disposal/treatment practices.
At-sea containment and recovery	Waste reduction – oil/water decanted back into the pocket of the boom to be re-skimmed and concentrated on-board. Oil-in-water concentration increases from 10% to at least 50%, thus reducing the bulking factor. Waste reduction – skimmers will be changed out to maximise the amount oil vs. water captured during the process (i.e. brush/disk skimmers over weir skimmers). The use of brush/disk skimmers can provide 90% oil concentration. Waste storage on-vessel – vessels will use a combination of IBCs and tanks to store larger volumes of oil/water. Temporary waste storage at marine terminal – robust logistics chain to enable efficient vessel/terminal unloading of product with 24/7 operations moving waste to final waste solution. This practice can help even out surges in generation/collection of waste. Final waste movement – 24/7 operations from temporary storage waste to final waste solution.
Shoreline cleanup	Pre-clean shorelines (where appropriate) of debris before oil strands to reduce solid waste. Waste reduction – manual over mechanical recovery. By applying this practice the bulking factor can be halved. Waste reduction – single bulk cleanup of shorelines rather than multiple cleanups. By applying this practice the bulking factor can be halved, however this practice can only be applied where SIMA process supports this. Waste storage on-site – utilising areas of natural containment. This practice can help even out surges in generation/collection of waste. Waste storage on-site – allowing product to be temporary stored in bunds and bins. Final waste movement – 24/7 operations from temporary storage waste to final waste solution.

14.6 DoT Waste Reporting Forms and Processes

Due to DoT's jurisdiction over marine oil pollution response activities in State waters, VOGA will align its process with the DoT OPEP (2015) to streamline the information gathering and recording keeping between VOGA and DoT and use these forms and processes for both Commonwealth and State water impacts.

The following DoT templates and forms may be adopted:

- Appendix C –Temporary Storage Site Suitability Assessment
- Appendix D – Site Waste Management Pro-Forma
- Appendix E – Waste Tracking Form

- Appendix G – Waste Management Sub-Plan Template.

14.7 Key Waste Streams

VOGA's Emergency Response Logistics Management Plan [VOG-7000-RH-0008] appendices present a detailed list of waste streams and likely containment requirements for a typical remote shoreline impact and a vessel offshore booming and recovery operation.

14.7.1 Non-oiled Waste

Prior to impact, recovery of flotsam and jetsam that may be impacted by a spill will greatly reduce the type and volume of oiled waste generated. Pre-impact removal of organic and non-organic waste will be undertaken where time and logistic support is available.

14.7.2 Offshore Oily Waters

Assuming favourable conditions, vessels operating offshore will collect floating oil via trawling booms and skimmers.

Offshore discharges of oily water are specified through MARPOL regulations, which are in turn regulated by AMSA for Commonwealth waters, and the DoT within State waters.

In the event that approval for discharge of the water phase is not obtained through AMSA and/or the DoT, the complete collected fluids will remain in the collection tanks and all will be treated as a collected waste. In this event, the duration of containment and recovery operations will be reduced due to restricted available ullage.

14.7.3 Onshore Oily Waters

It is intended that shoreline storage of liquids will be of short duration, with third-party contractors removing waste as soon as is practicable. All temporary storage of liquids will be performed within bunded areas and as per regulatory requirements.

14.7.4 Solid Wastes

While oil-contaminated sand, rocks and debris from mechanical and manual cleanup operations will have considerable oil-contents (2–10%), recovery of these oils and cleaning of absorbed debris is difficult. At present, there are no readily available treatment options for these materials to reduce waste volumes from the operations, and disposal via landfill or incineration are the only options available.

Oily sands will be collected along the affected coastlines, skip bins will be distributed by telehandlers and readily accessible by clean-up crews. Wastes will then be either collected by operating mobile plant such as excavators, or through manual waste removal (bagged waste), and deposited into these bins.

In areas that are inaccessible by vehicles, barges may be used for the initial transfer operations, and transported to the marine operational base for pickup.

Oil-contaminated sands and soils recovered during the operations will be deemed requiring Class III or Class IV landfills for disposal. In the event that oils are collected in such a form as to be too contaminated for landfill disposal, yet not liquid enough to be incorporated into the waste oil stream, then these solids will be segregated and despatched for incineration.

14.7.5 Oily Organics

In conjunction with oil-contaminated sand, rocks and debris from mechanical and manual cleanup operations, it is anticipated that approximately 5% of the total solids stream will be organic in nature, consisting predominantly of seaweed, seagrasses and animal carcasses. In line with the waste hierarchy, it is desired to segregate these wastes and dispose to a composting facility to be turned into compost suitable for reuse.

Animal carcasses may be collected in plastic bags and stored in refrigerated containers were appropriate for later pathology testing or as directed by DBCA. Authorised third parties will transport the waste to a commercial composter.

14.7.6 Remote Location/Islands

Methods used for cleaning up shorelines on Islands or remote areas of coastline will be similar to those for mainland shorelines. However, unlike on the mainland, the options of large mechanical waste collectors (bulldozers), easily accessible accommodation and immediate waste transfer via trucks is not available. These logistical challenges are overcome through the use of vessels capable of shoreline landings, smaller machinery and helicopters to deliver equipment and personnel and remove collected waste.

Access and all cleanup activities will be conducted via vessels or helicopters and require the establishment of hot/cold/warn areas to mitigate contamination waste collection will generally be undertaken manually with waste collected in 20 kg bags to mitigate manual handling risks. As the response develops, tactical plans will establish if small mechanical equipment can be delivered to remote locations.

14.7.7 Oil Spill Equipment Cleanup

During and after response activities, all oil contaminated PPE and disposable equipment/items will be placed in separate plastic bags and transported in skips to a waste facility for final disposal. Reusable equipment will be placed in skips and transported to the boom maintenance area for cleaning.

14.8 Waste Assessment

An assessment of waste estimates for containment and recovery and shoreline cleanup assumptions have guided VOGA to establish upper maximum waste volumes which have been planned for within this OPEP. Total volume of oil ashore from a single worst case spill trajectory is basis from which oil estimates are calculated using a bulking factor of 10.

The best configuration of waste storage options will be chosen at the time of a spill to ensure the most appropriate size storage is allocated to land based and offshore waste collection.

Waste recovery from open water and onshore will take a few days to ramp up, which will provide time for shore-handling capacity to build sustainable storage and transport capacity.

Sufficient capacity at recovery sites both offshore and onshore to contain above quantities on a daily turnaround basis is required. Transfer points from offshore to onshore require capacity to offload liquid to tankers or vacuum trucks for transport to processing or temporary storage, or swap out of IBCs where these are being used will also be required.

Section 15 – Relevant Person Engagement

15.1 Relevant Persons

Relevant Persons engagement is an important part of emergency management response, whether assisting with coordination of control and mitigation measures, liaison with regulatory bodies or responding to potential impacts on surrounding communities and businesses.

This section outlines the strategy to engage stakeholders during an OSR. The process for engaging relevant stakeholders pre-environmental plan approval or pre-campaign is addressed in the EP.

The stakeholders covered under this section of the plan include:

- Key stakeholders for regulatory approval purposes
- Influencers
- Interested parties (including communities, indigenous landowners and businesses) who are or may potentially be impacted by the oil spill or the associated response activities.

Key response/resource agencies are engaged through other sections of the ICT.

15.2 Relevant Persons Engagement Strategy

15.2.1 Overview

In the very unlikely event of a significant event occurring, VOGA's primary responsibility is to the health and safety of all personnel impacted by the spill or the spill response. The relevant person engagement process will at all times reflect and support this responsibility.

The purpose of the strategy is to ensure during an OSR, VOGA:

- Engage government agencies to obtain the appropriate approvals and address regulatory requirements during an OSR
- Manage/mitigate the impact to surrounding communities, commercial operations including fishing and other petroleum operators
- Keep stakeholders informed as required.

The strategy to engage relevant persons during an OSR is provided in the following section. The engagement can be broken down into five distinct phases:

1. Pre-activity.
2. Activity.
3. Post-spill/pre-exposure.
4. Post-spill/post-exposure.
5. Termination.

The nature and frequency of further and ongoing stakeholder engagement will depend on the scale, duration, impact and other specifics of each incident.

15.2.2 Pre-activity

During this stage of the project, the objective is to ensure that:

- Stakeholders have been defined, classified and consulted as appropriate
- Regulatory requirements are being met
- The socio-economic activities that may be impacted by a potential spill or the response are identified
- Stakeholder contacts list has been checked and updated, if required
- Capability to provide response has been confirmed and outlined in a plan to implement the strategy available.

15.2.3 Activity

During this stage of the project, the focus is to maintain contact details and ensure information on the project and associated EP is accessible. A dedicated email address will be available at all times to interested parties wishing to contact the company.

15.2.4 Post-spill/Pre-exposure

The purpose during this stage is to manage the potential impact that spill and response activities may have on stakeholders. This process is initiated as soon as a spill has occurred and the ICT is activated. During this stage, VOGA manages/mitigates the impact to stakeholders by:

- Continually identifying specific stakeholders who may potentially be impacted by the spill and response strategy
- Where possible, contacting relevant interested parties prior to impact and keeping these stakeholders regularly informed and engaged
- Providing regulatory notifications and updates
- Providing relevant safety information on the event and potential hazards and precautions associated with the spill and response activities
- Confirming the process to engage with stakeholders regarding potential socio-economic impacts the spill and associated response may have and recording stakeholder input and responses
- Providing information to media and engage influencers as required.

15.2.5 Post-spill/Post-exposure

The purpose of this stage is to manage the direct impact that the spill and response activities have on stakeholders. During this stage, VOGA manages and attempts to limit the impact to stakeholders by:

- Continuing to identify specific stakeholders who are being impacted by the spill and response strategy
- Providing relevant safety information on the event and potential hazards and precautions associated with the spill and response activities
- Engaging with relevant interested parties and keeping them regularly informed
- Implementing a process to monitor, report and record socio-economic impacts (positive and negative) as a direct result of a spill and spill response
- Where possible, implementing measures to manage or limit the direct socio-economic impact of the spill and spill response (e.g. counselling, establishing community and recreational centres, providing financial support)
- Providing regulatory notifications and updates
- Providing information to media and engage influencers as required.

15.2.6 Termination of Oil Spill Response

Community and stakeholder understandings and expectations will play a role in both the decision to terminate a response and the acceptability of that decision. Consultation with these groups would be undertaken by VOGA prior to any termination decisions being implemented.

It should be noted that although the OSR may be terminated, there will be a continued and ongoing consultation with stakeholders impacted by the oil spill until a resolution is achieved.

15.2.7 Roles and Responsibilities

The initial high-level division of engagement responsibilities can be summarised as follows:

- Stakeholder Liaison Officer – regulators, VOGA employees and VOGA contractors (not spill responders), VOGA Head Office.
- Logistics Officer – combat agencies; industry, including adjacent operators and contractors (spill responders).
- Public Information Officer:
  - Community Liaison – local communities and interested parties, business, non-governmental organisations
  - Media Liaison – local, national and international media
  - Public Information Controller – manage and coordinate all external communications.

The above three positions are located with the ICT and are involved in the regular debriefs and issuing of the IAP. These positions all report to the Corporate Command Operations Chief either directly or through the Stakeholder Liaison Officer.

15.2.8 Documentation and Record Keeping

All external communications occurring through the ICT, including with government, industry and community stakeholders, are documented in the ICT spill log or each officer's personal log. The Public Information Officer also records and manages all media inquiries and responses.

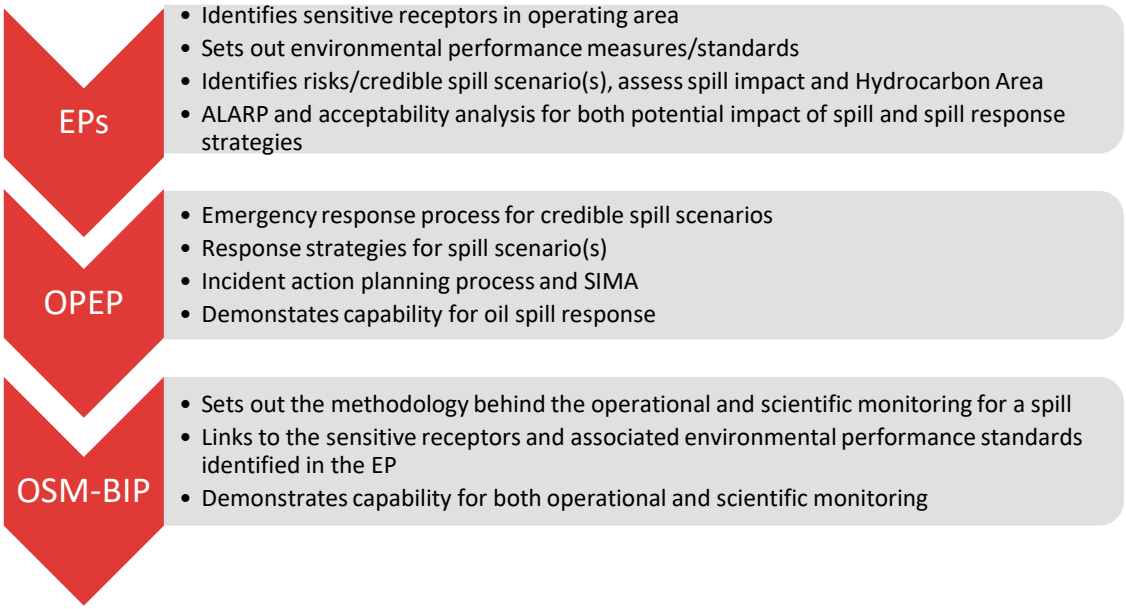
VOGA maintains comprehensive information on all identified stakeholders, including telephone, email and personnel details, and has access to an external email communications system in the event of impact to its own system.

Section 16 – Operational and Scientific Monitoring

The Wandoo Field OSMP [WAN-2000-RD-0001.04] (Appendix B) has been designed as part of an integrated package of the environmental management documentation including the EP and the OPEP. The OSM BIP is informed by the EP through the identification of the sensitive receptors in the Wandoo Field operating environment that could be impacted during an oil spill. The monitoring activities detailed in the OSM-BIP may also provide a basis for:

- Determining if (and/or when) the goals set for environmental protection are achieved
- 'Testing' the efficacy of predictions of impact presented in the EP
- 'Testing' the effectiveness of the oil spill response strategies within the OPEP.

Figure 16-1: Relationship between OSMP, OPEP and EP



The Wandoo Field OSMP [WAN-2000-RD-0001.04] (Appendix B) will be activated at the same time as the OPEP. The following details regarding the activation and undertaking of the OSMP include:

- Values and receptors to be monitored
- Integration of operational and scientific monitoring
- Operational monitoring plans
- Scientific monitoring plans
- Data governance
- Roles and responsibilities
- Resourcing and capabilities.

Section 17 – Health and Safety

VOGA is committed to the health and safety of all personnel involved in OSR. VOGA's company policies and procedures in regards to safe working practices will be maintained during all OSRs.

Key resources providing OSR support are provided with OH&S information (including Safety Datasheets) as part of the briefing pack.

AMSA has a specific health and safety guideline for marine oil spill operations which includes a risk assessment for OSR operations as well as Standard Operating Procedures for National Plan equipment. This information will be considered in the development of task-specific instructions.

All operational activities will include a process such as a Job Hazard Analysis (JHA) to identify hazards, the risk rating associated with hazards and mitigation measures to ensure a safe work environment.

Section 18 – Logistics Management

The VOGA Emergency Response Logistics Management Plan [VOG-7000-RH-0008] contains outputs from the identification of resources required and the scope of works/services required to deliver those resources. It is maintained as live document based on the resources identified and the Contractor Scope of Works in the OSR Capability Review [VOG-7000-RH-0009]. The plan provides details of the logistics support available to support the implementation of this.

On activation of the ICT for OSR, incident specific logistic plans will be developed to support effective logistics management and deployment. Depending on the size of logistics activities, SIMOPS plans may be developed to manage the hazards associated with multiple logistics interfaces within a confined area. The Logistics Officer is responsible for creating the logistics and SIMOPS plans.

Figure 18-1: Structure of VOGA logistics planning

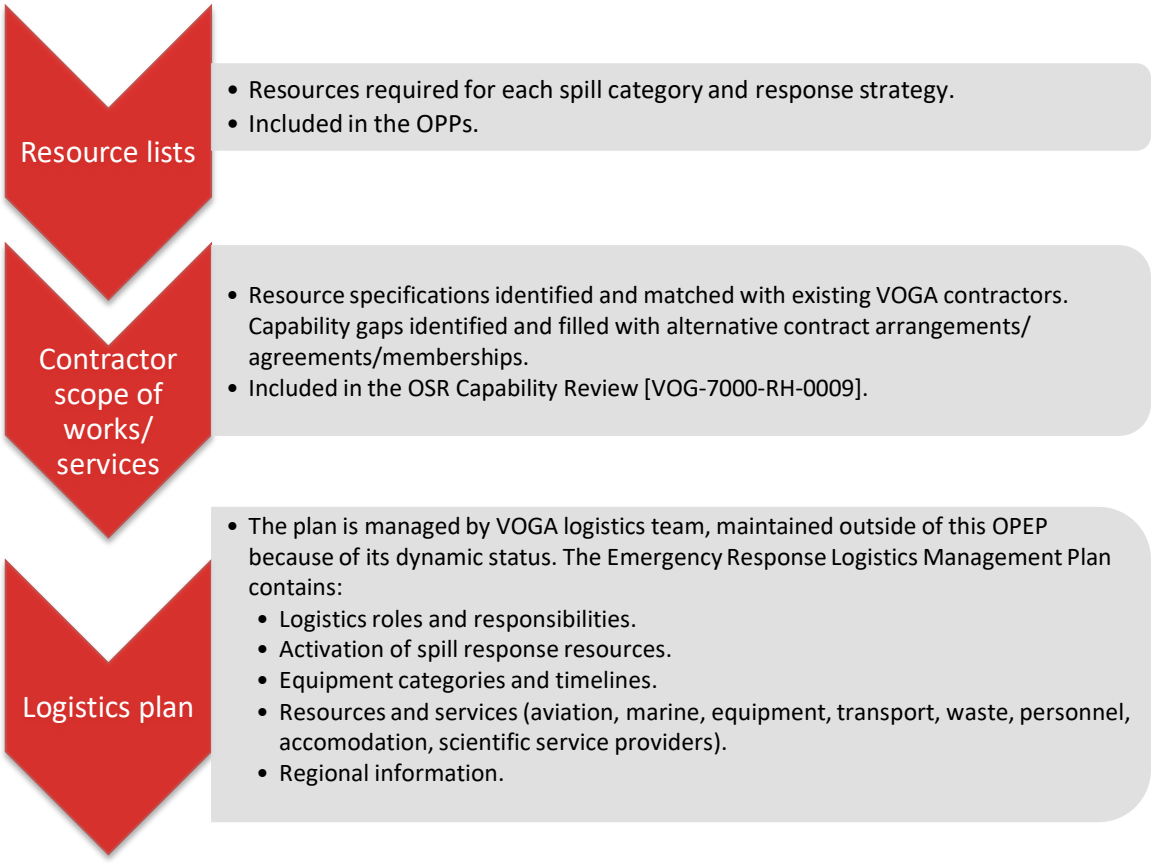


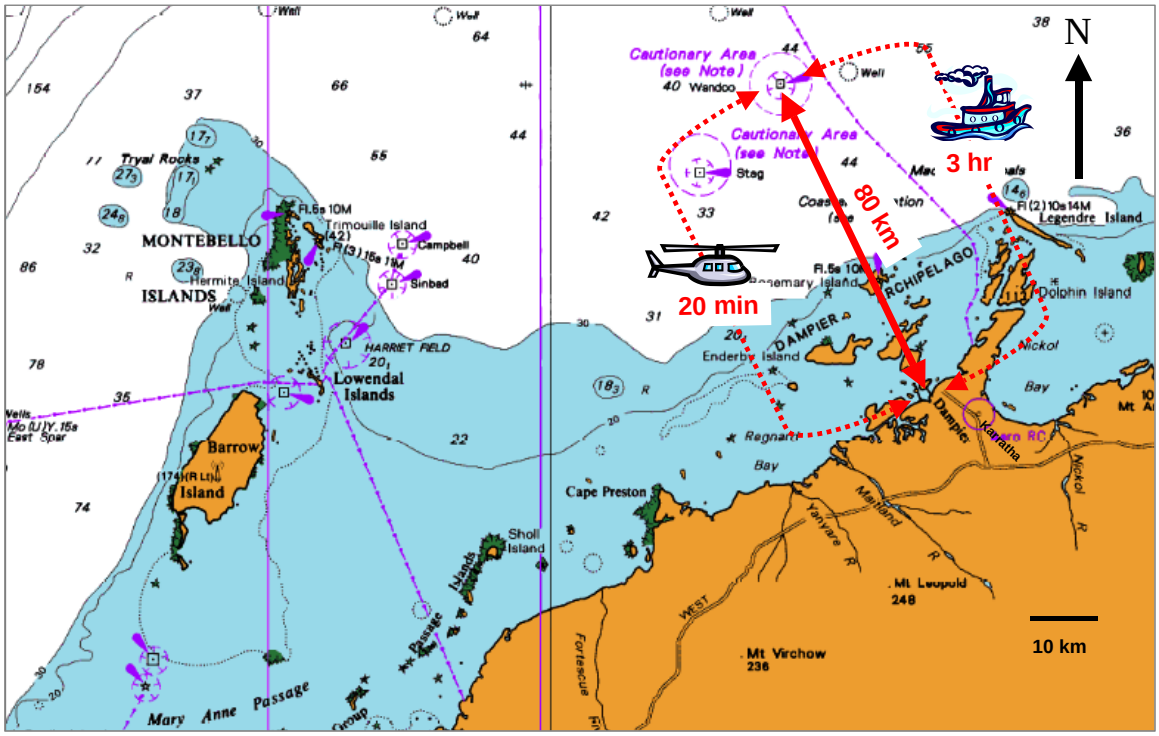
Table 18-1 provides approximate travel times by air and sea as well as distance in nautical miles between the Wandoo facilities and neighbouring locations. This information can be used to inform the aerial surveillance and aerial dispersant operations of travel times, distances and be used to estimate endurance out on site. Figure 18-2 depicts these travel times and distance on an image of a navigation chart.

Table 18-1: Travelling time between Wandoo facilities and neighbouring locations

Location	Approximate flying time to	Approximate sailing time	Distance (nm)
Wandoo Tanker/CALM Buoy	5 minutes	10 minutes	1.5
Karratha	20 minutes	n/a	48
Dampier	n/a	3.5 hours	35
North Rankin A	15 minutes	3.5 hours	38
Barrow Island	35 minutes	6.5 hours	65
Port Hedland	1 hour 15 minutes	12.5 hours	125
Onslow	1 hour 10 minutes	11.5 hours	115
Perth	2 hours 20 minutes	n/a	n/a

Note: Flying time based on S76 helicopter (@ 140 knots).

Figure 18-2: Distance and travel time to Wandoo facilities from Dampier



Section 19 – Tactical Response Plans

Oil Spill Tactical Response Plans (TRPs) identify site-specific response actions for locations predicted to be contacted by oil in a spill event. Development of these plans reduces the response time and improves the effectiveness of a response.

TRPs include photographs, maps, environmental sensitivity information, and detailed response information of use to responders such as booming locations.

The tactical planning process identifies how an oil spill IAP will be implemented at a specific location. In contrast to the broader OPEP documents, TRPs provide a response perspective with specific short-term actions and details that allow responders to best access, assess, and quickly respond to spills.

VOGA has access to shoreline tactical plans for priority shorelines, either previously obtained or available on request from the relevant titleholders. Priority was identified based primarily on locations with shoreline contact within 7 days and sensitivity rated very high or high, as per marine oil pollution risk assessment and protection priorities for Pilbara region released by WA DoT (reference DOT307215, date October 2017), with consideration of extent and likelihood of shoreline contact.

A gap analysis of available information from titleholders and agencies against priority areas has been undertaken with assistance from DoT and potential cooperative arrangements investigated (Table 19-1). Each listed titleholder has indicated agreement to provision of the relevant TRPs upon request by VOGA at the time of an incident.

Table 19-1 TRP availability

Priority location	Titleholder/Organisation with TRP
Dampier Archipelago	Pilbara Port Authority (PPA), Woodside, Santos, VOGA (Delambre Island)
Montebello Islands	Woodside, Santos
Barrow Island	Chevron
Legendre Island	Woodside, Santos, PPA
Lowendal Island Group	Woodside
Murion Islands	Woodside
Serrurier Island Group	Chevron
North West Cape	Woodside, Santos

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Appendices

Appendix A
Wandoo Crude Weathering Trials and Dispersant Efficacy Testing Report

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ANALYSIS OF WANDOO CRUDE: WEATHERING TRIALS AND DISPERSANT EFFICACY

EXECUTIVE SUMMARY

ChemCentre were requested by Vermilion Oil & Gas Australia (VOGA) to conduct an oil spill study of Wandoo crude oil in a Mackay Chamber. Spills of Wandoo crude were simulated under both summer and winter weather conditions, and the summer weathering conditions were used to test both fresh and weathered oils for their dispersibility with five different dispersants (Ardrox, Corexit 9500A, Dasic Slickgone EW, Dasic Slickgone NS, and Finasol OSR 52).

Over half of the oil spilled on the water evaporates after 10 days of weathering in summer conditions, while ten days of winter weathering results in over a third of the oil evaporating. Dispersant trials were conducted under summer weathering conditions. All the dispersants tested were effective at dispersing a large percentage of the oil on the water up to three days after the spill.

INTRODUCTION

VOGA requested ChemCentre to conduct a study on Wandoo crude oil, and estimate a 'window-of-opportunity' for dispersant use in case of a spill. The study was broken up into several tasks.

- Task 1: Mackay Chamber weathering trials on Wandoo Crude using summer and winter conditions
- Task 2: Artificially create large volumes of weathered Wandoo Crude
- Task 3: Dispersant trials on fresh Wandoo Crude in the Mackay Chamber
- Task 4: Dispersant trials on Wandoo Crude at different weathering states in the Mackay Chamber
- Task 5: Compile report (including video footage of dispersant trials)

SAMPLE IDENTIFICATION

A sample of Wandoo crude was received from VOGA. The following dispersants were also received:

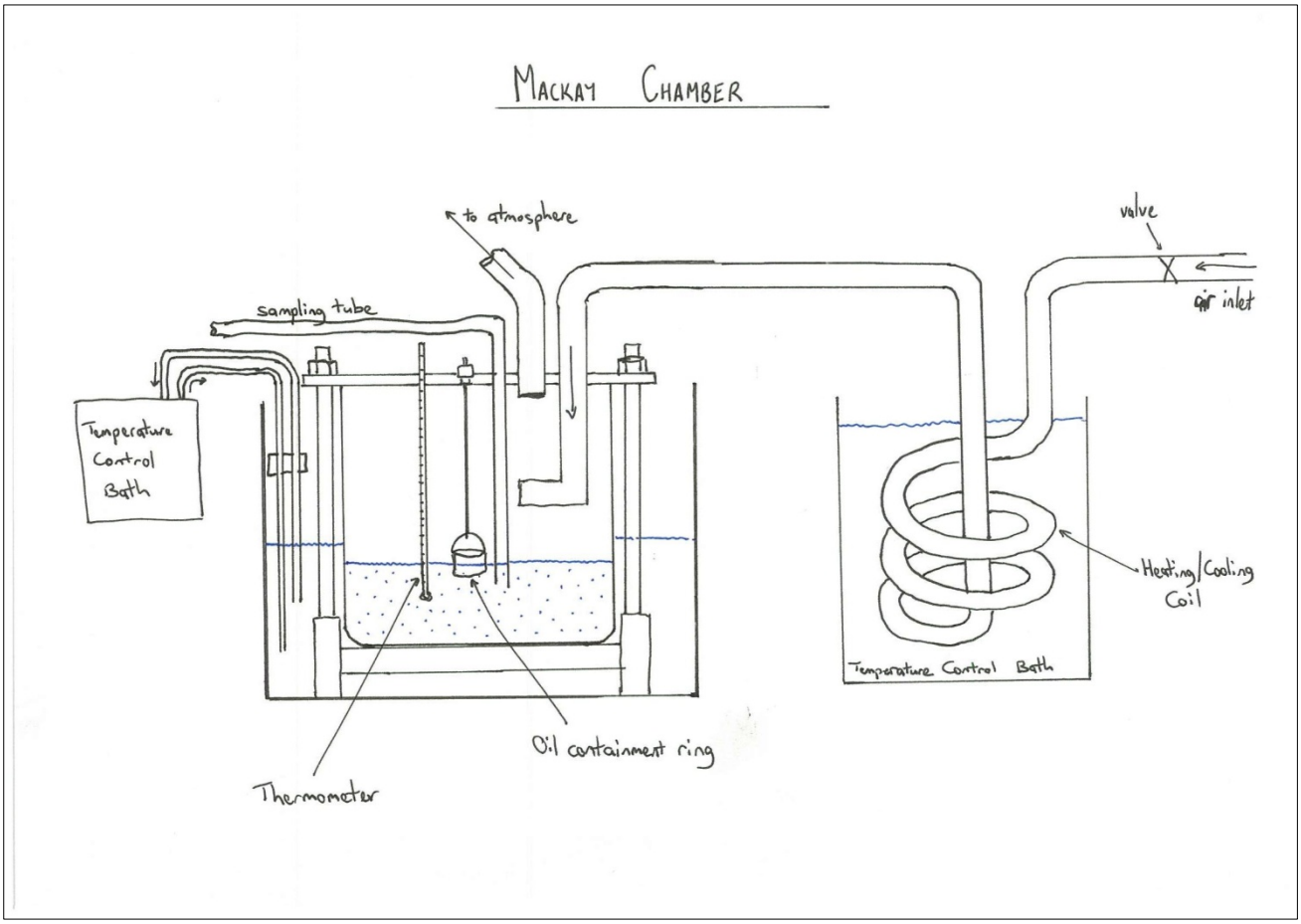
- Ardrox
- Corexit 9500A
- Dasic Slickgone EW
- Dasic Slickgone NS
- Finasol OSR 52

MACKAY CHAMBER

The Mackay Chamber (also called the Mackay-Nadeau-Steelman test apparatus or MNS Chamber) is recognised internationally as the method of choice for simulating the behaviour of oil at sea. While no laboratory test can precisely reproduce the conditions at sea of an actual spill, the Mackay Chamber controls the major parameters that affect the weathering of oil – sea temperature, air temperature, and wind speed (which determines wave energy).

The Mackay Chamber is pictured in Figure 1. The test sea water sits in the inner tank. The inner tank sits within the outer tank which acts as a temperature-controlled water bath, which indirectly heats (or cools) the sea water in the inner tank to the appropriate sea temperature. The air inlet and outlet pipes create a circular wind pattern inside the inner tank. A valve on the air inlet line is calibrated to simulate the appropriate wind speed, and the inlet line runs through a second temperature controlled water bath to reach the appropriate air temperature.

Figure 1



There are two main applications of the Mackay Chamber: (1) simulation of a spill over several days to observe the changes to an oil as it weathers, and (2) testing dispersants on an oil spill to determine their efficacy (both on fresh and weathered oils).

SCOPE OF WORK

ChemCentre were requested by VOGA to undertake the following tests.

Weathering

Two separate Mackay Chamber trials were requested, with weathering to take place over typical summer conditions (to represent a 'reasonable-worst-case' scenario), and typical winter conditions (to represent a 'reasonable-best-case scenario). The sea state conditions were provided by VOGA, and are listed in Table 1.

Table 1: Climate conditions

Season	Summer	Winter
Sea temperature	26°C	26°C
Air temperature	28°C	22°C
Wind Speed	15 knots	10 knots
Sea salinity	36‰	36‰

ChemCentre were asked to take samples of weathered oil after 1, 2, 3, 4, 5, and 10 days, and the weathering loss of the oil at these times was to be calculated. If the weathering loss of the oil had not plateaued after 10 days, an additional sample was to be taken at 21 days.

Heat Assisted Volume Reduction

To accommodate dispersant trials, a larger volume of weathered oil is required. ChemCentre were requested to make up larger volumes of artificially weathered oil to replicate oil weathered under summer conditions after 1, 2, 3, 4, 5, and 10 days.

Dispersant trials

Five separate dispersants were sent to ChemCentre for testing: Ardrox, Corexit 9500A, Finasol OSR 52, Slickgone EW, and Slickgone NS. ChemCentre were requested to initially test all five dispersants on fresh oil and the HAVR oils simulating 1 and 2 days of summer weathering. If the dispersibility of Wandoo crude was greater than a critical dispersibility threshold (set at 15% by Vermilion Oil & Gas), then further dispersibility trials would be done successively on 3, 4, 5, and 10 day weathered oils. If the dispersibility of any oil dropped to below the 15% threshold, testing on further weathered oils with that dispersant would cease.

METHODS

Weathering trial

Oil (10 mL) is placed in the Mackay Chamber with 10 L of sea water under the appropriate environmental conditions (sea temperature, air temperature, wind speed, and salinity).

Samples of the oil are taken from the Mackay Chamber at several time points (1, 2, 3, 4, 5, 10, and 21 days). The samples are then analysed by gas chromatography with flame ionisation detection (GC-FID). The area of the whole oil chromatogram is then compared to the area of some late eluting 'biomarker' peaks. These peaks can be seen in the chromatogram eluting between 19 and 22 minutes, and are resistant to weathering. An increase in biomarker concentration is observed as the oil weathers, and this increase is used to calculate the weathering loss of the oil.

Heat Assisted Volume Reduction (HAVR)

The small samples taken during the weathering trial are insufficient to use in a dispersant trial, but the data collected from the loss calculations can be used to artificially create larger volumes of weathered oil. Heat is gently applied to a pre-weighed sub-sample of fresh crude. The volatile components of the crude oil evaporate until the appropriate weight loss is achieved.

Dispersant trial

Oil (10 mL) is placed in the oil containment ring of the Mackay Chamber with 10 L of sea water under the summer conditions previously used in the weathering trial. Dispersant (500 µL) is added dropwise and allowed to soak into the oil for one minute before the containment ring is released and the oil-dispersant mixture allowed to spread over the waves in the chamber. After ten minutes of wave action a sample of the water is taken (called '10A') and the 'wind' is turned off to allow the water to come to rest. After five minutes of quiescence another water sample was taken (called '5Q').

The 10A and 5Q water samples are extracted with an organic solvent and analysed by GC-FID together with standards of Wandoo crude (fresh or weathered, as appropriate). The total peak area under the chromatogram is proportional to the concentration of oil in the extract. In this way, the total mass of oil dispersed in the water column can be calculated. The 10A result represents the total amount of oil dispersed through the water column, and is most relevant to most ocean conditions. During the five minutes of quiescence that occurs between taking the two samples, larger droplets of oil will rise to the surface, rather than being held under by the constant agitation of wave energy. The 5Q result therefore represents oil that is chemically entrained in the water column, and not the oil that is physically dispersed.

The 10A value is considered to be the best measure of dispersibility, and throughout this report, 'efficacy' of a dispersant refers to this result.

RESULTS

Weathering trial

The results of the weathering trials are shown in Table 2. GC chromatograms showing the loss of volatile components of the Wandoo Crude appear in Appendix A.

Table 2

Time	Summer conditions Loss (w/w%)	Winter conditions Loss (w/w%)
1 day	19%	20%
2 days	29%	23%
3 days	36%	23%
4 days	43%	28%
5 days	48%	29%
10 days	53%	34%
21 days	55%	38%

Heat Assisted Volume Reduction (HAVR)

The reductions in Table 3 were applied to sub-samples of Wandoo Crude. These losses were chosen to replicate the Wandoo Crude after various time points used in the summer weathering trial.

Table 3

HAVR	A	B	C	D	E	F
Loss (w/w%)	19%	29%	36%	43%	48%	53%

Dispersant trials

The results of the dispersion trials appear in Table 4. For each dispersant, '10A' represents the percentage of the weathered oil that has dispersed through the water column after 10 minutes of agitation. The percentage of oil that remains dispersed after a further 5 minutes of settling is reported under '5Q'.

Table 4

Dispersant	Ardrox		Corexit 9500A		Finasol OSR 52		Slickgone EW		Slickgone NS	
Oil	10A	5Q	10A	5Q	10A	5Q	10A	5Q	10A	5Q
Fresh	86%	44%	100%	96%	100%	78%	100%	59%	100%	53%
A – 1 day weathered	72%	39%	79%	53%	78%	58%	100%	72%	100%	93%
B – 2 days weathered	82%	47%	84%	64%	63%	17%	100%	85%	100%	91%
C – 3 days weathered	89%	37%	100%	86%	100%	56%	100%	46%	100%	61%
D – 4 days weathered	49%	29%	66%	39%	78%	68%	100%	35%	93%	24%
E – 5 days weathered	25%	0%	54%	3%	98%	56%	39%	8%	5%	0%
F – 10 days weathered	13%	3%	35%	7%	31%	21%	23%	7%	-	-

Additionally, a trial was also conducted testing the natural dispersibility of Wandoo Crude (i.e. 10 mL of crude oil with no dispersant). This test was conducted under the same summer conditions as the dispersant trials. No natural dispersion was observed (efficacy = 0%). Note that AMSA accepts a dispersant on to the Oil Spill Control Register if it has a dispersant efficacy of 70%.

DISCUSSION

Note: In ChemCentre's experience, the following descriptions are appropriate for different dispersibility levels of Wandoo Crude:
Efficacy > 90% *Excellent*
Efficacy 60-90% *Good*
Efficacy 40-60% *Moderate*
Efficacy 10-40% *Poor*
Efficacy < 10% *Very poor*

The weathering trial showed that both summer and winter conditions initially gave similar weathering, but after the first day the summer conditions volatilised more of the oil than the winter conditions, with only 45% of the oil remaining on the water after 3 weeks of summer, compared with 62% of oil remaining on the water after three weeks of winter.

The dispersant trials gave particularly good results for all dispersants if used in the first three days. Of note was the increase in efficacy observed in most samples on a 3-day weathered sample over a 2-day weathered sample. While some variability in results might be expected, three of the dispersants had increased efficacy after three days, while the remaining two (Slickgone NS and Slickgone EW) were already giving 100% dispersant efficacy. While this result might suggest that spill responders dealing with a 2-day old slick might choose to wait a day to improve their response, this is not recommended due to the difficulty in ensuring that lab trials match the exact weathering conditions of a real spill.

The apparent increase in efficacy was checked by repeating several of the trials (Corexit 2- and 3-day, and Finasol 3-, 4-, and 5-day). The results of the repeat trials were mostly consistent with the original trials (see Table 5).

Table 5

Trial	Original results		Repeat trial results	
	10A	5Q	10A	5Q
Corexit 9500A 2-day	84%	64%	66%	43%
Corexit 9500A 3-day	100%	86%	100%	88%
Finasol OSR 52 3-day	100%	56%	100%	69%
Finasol OSR 52 4-day	78%	68%	68%	45%
Finasol OSR 52 5-day	98%	56%	95%	23%

Ardrox shows good efficacy in the first 3 days, but shows moderate to poor dispersibility beyond that.

Corexit 9500A shows good to excellent efficacy in the first 3 days, but a decrease in dispersibility beyond that.

Finasol OSR52 gave quite erratic results, even after checking several of the results with repeat tests. Despite this, good to excellent efficacy is shown on oils up to 5 days weathered, but poor dispersibility on 10-day weathered oil.

Slickgone NS shows excellent dispersibility oils up to 4 days weathered, but a dramatic drop in dispersibility on 5-day weathered oil. Due to the failure of this dispersant to reach a critical dispersibility of 15%, the remaining 10-day weathered dispersant trial was not conducted, as it is expected to give very poor dispersibility. The dramatic cut-off from very high dispersibility to virtually no dispersibility is also cause for caution – if the exact weathering of a real spill differs slightly from the lab trial, then this dramatic cut-off may occur earlier. Caution must therefore be used in using Slickgone NS after two days.

Slickgone EW shows excellent dispersibility oils up to 4 days weathered, but poor dispersibility on 5- and 10-day weathered oil. There is also a sudden drop from excellent dispersion at day 4 to poor dispersion at day 5. Caution is advised if using Slickgone EW after three days.

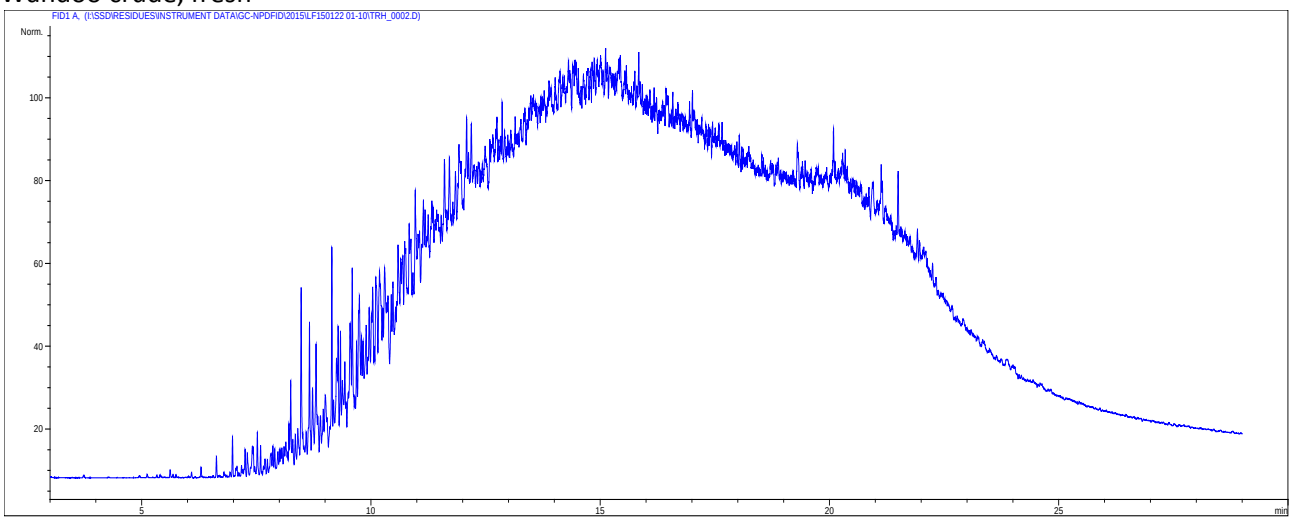
These dispersibility results are only applicable given the summer conditions set for the Mackay Chamber. Dispersibility under winter conditions may change, although without testing, it is impossible to know what that change may be. In general, colder conditions lead to more viscous oil, which is harder to disperse, leading to lower dispersant efficacies. On the other hand, the lower degree of weathering observed indicates that the window-of-opportunity for dispersant use may be longer, as increased weathering in summer also leads to lower dispersant efficacies.

Leif Cooper
Senior Chemist
12 May 2015

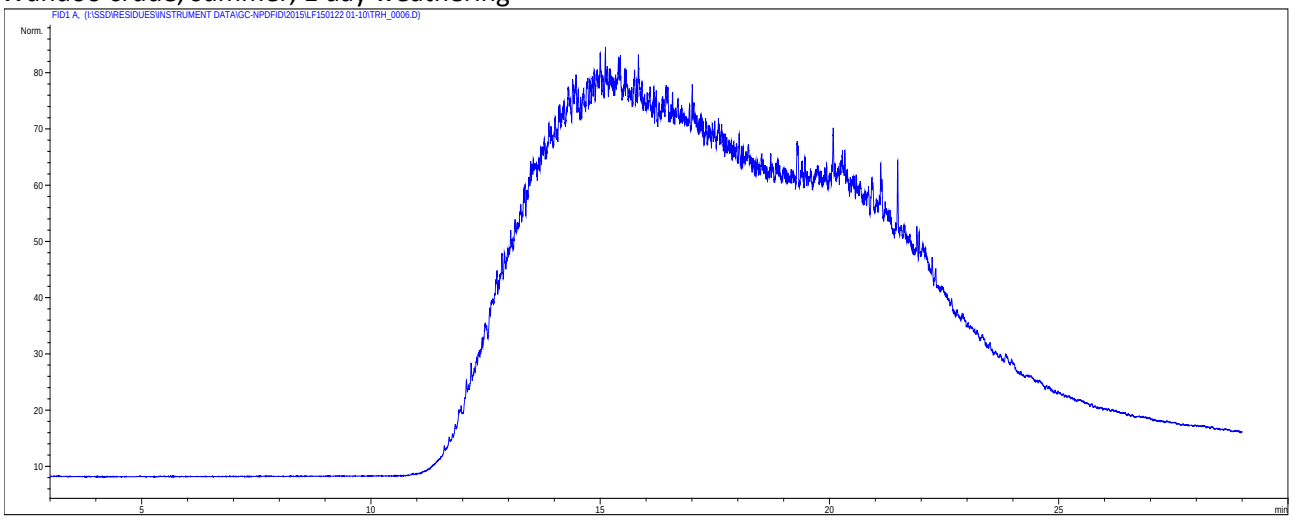
APPENDIX A

GC chromatograms of fresh and weathered oil

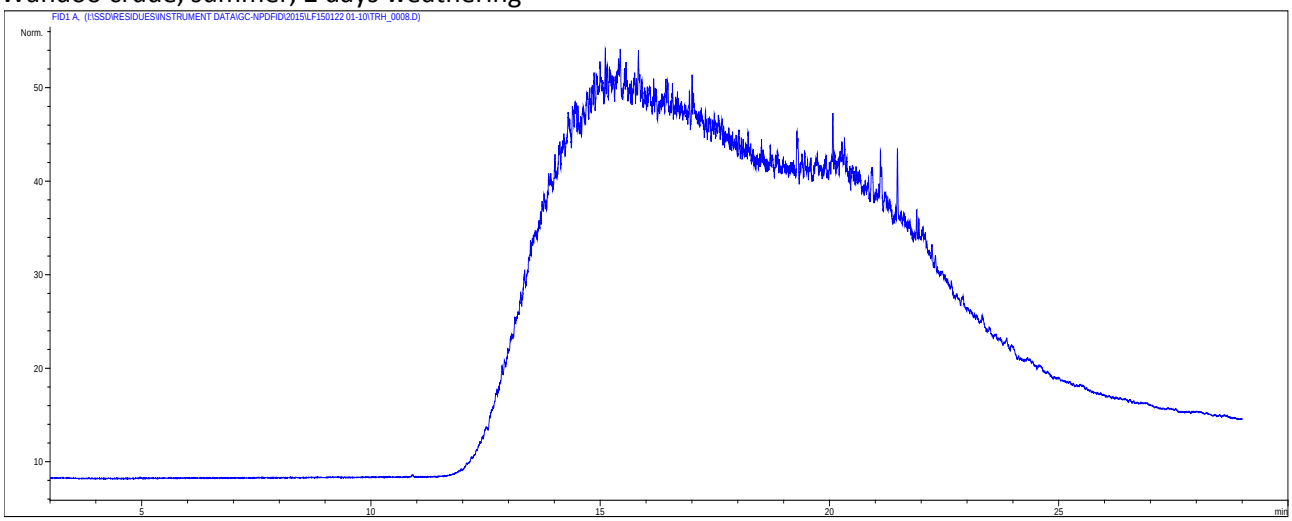
Wandoo crude, fresh



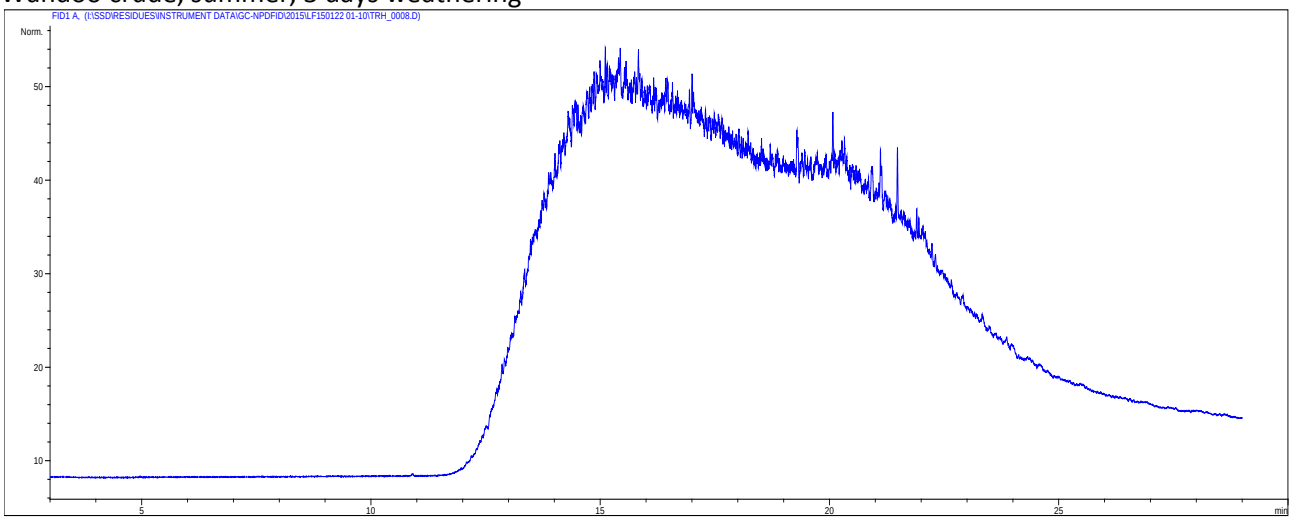
Wandoo crude, summer, 1 day weathering



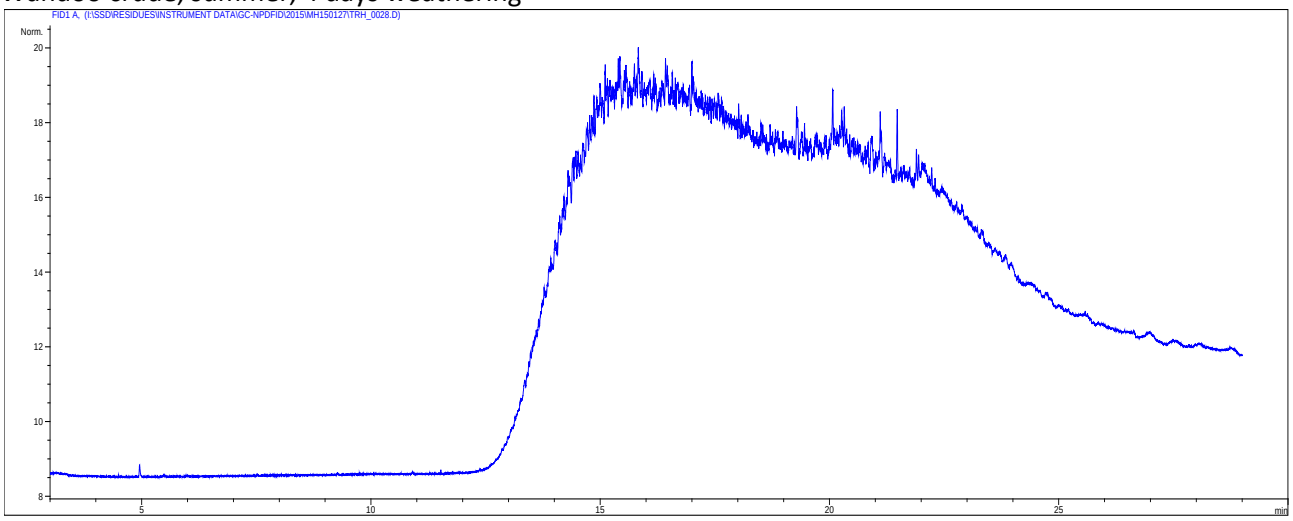
Wandoo crude, summer, 2 days weathering



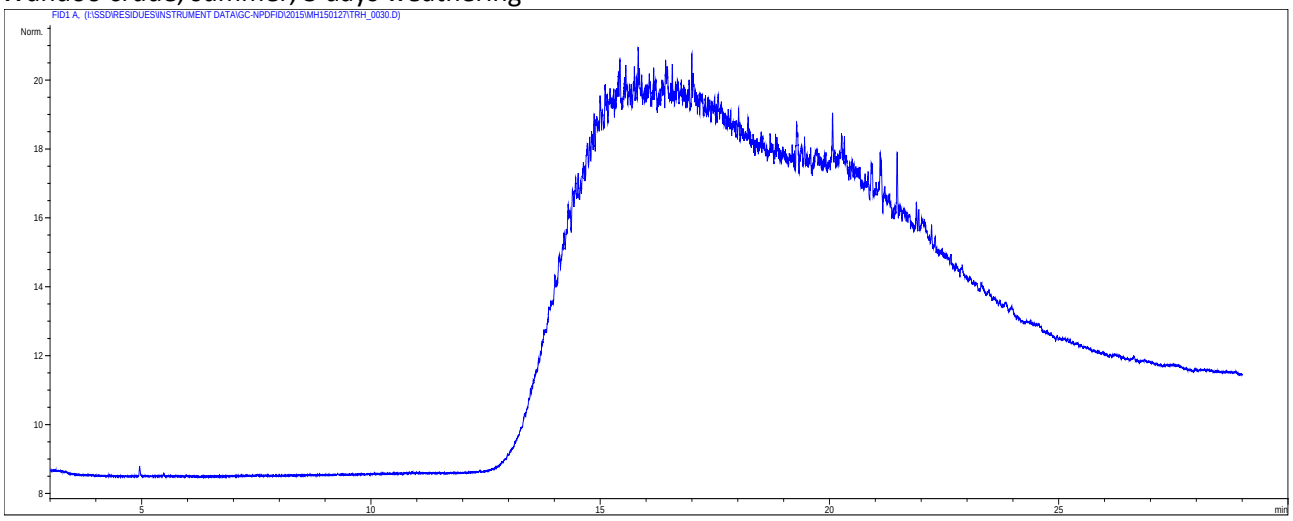
Wandoo crude, summer, 3 days weathering



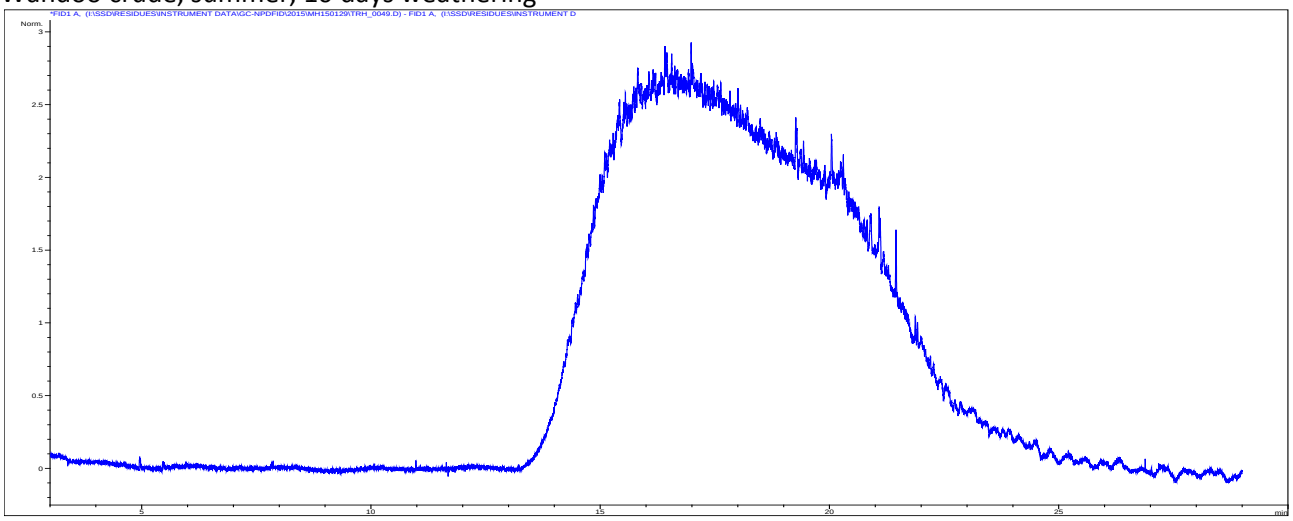
Wandoo crude, summer, 4 days weathering



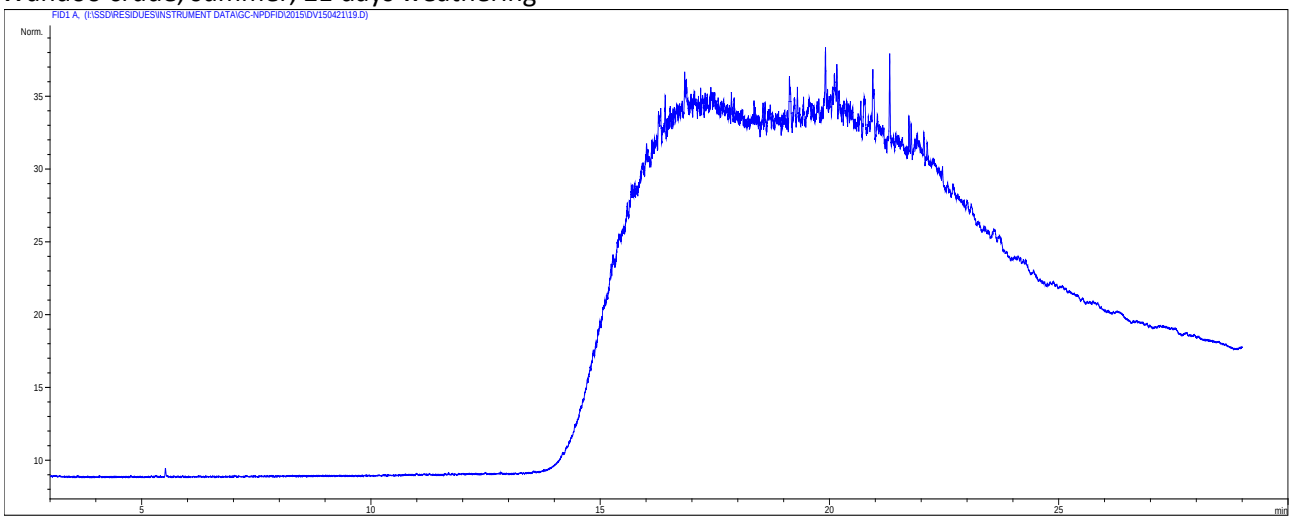
Wandoo crude, summer, 5 days weathering



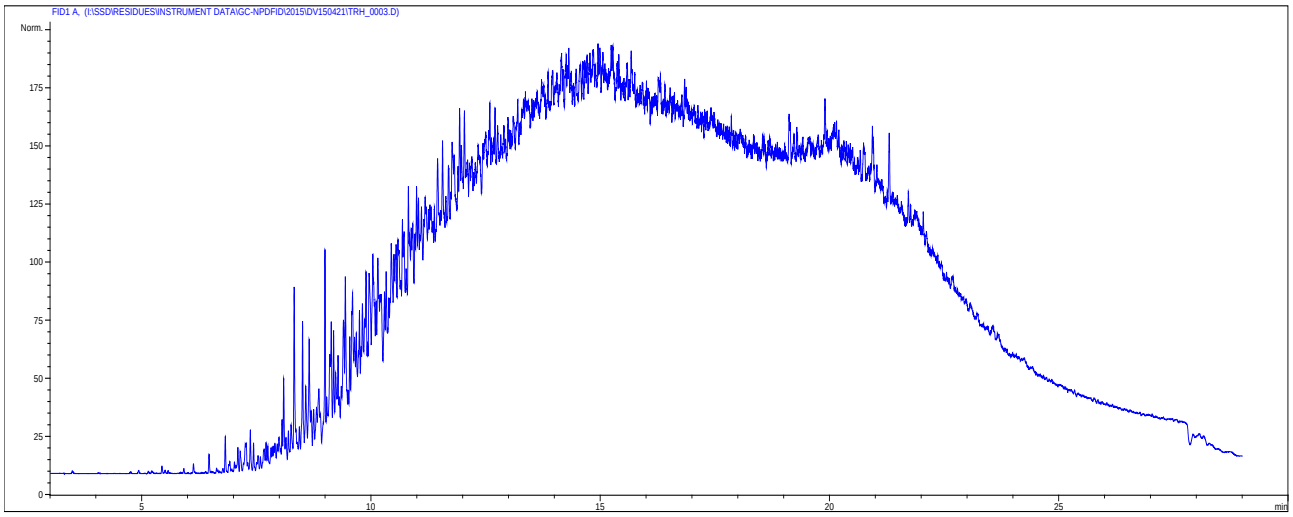
Wandoo crude, summer, 10 days weathering



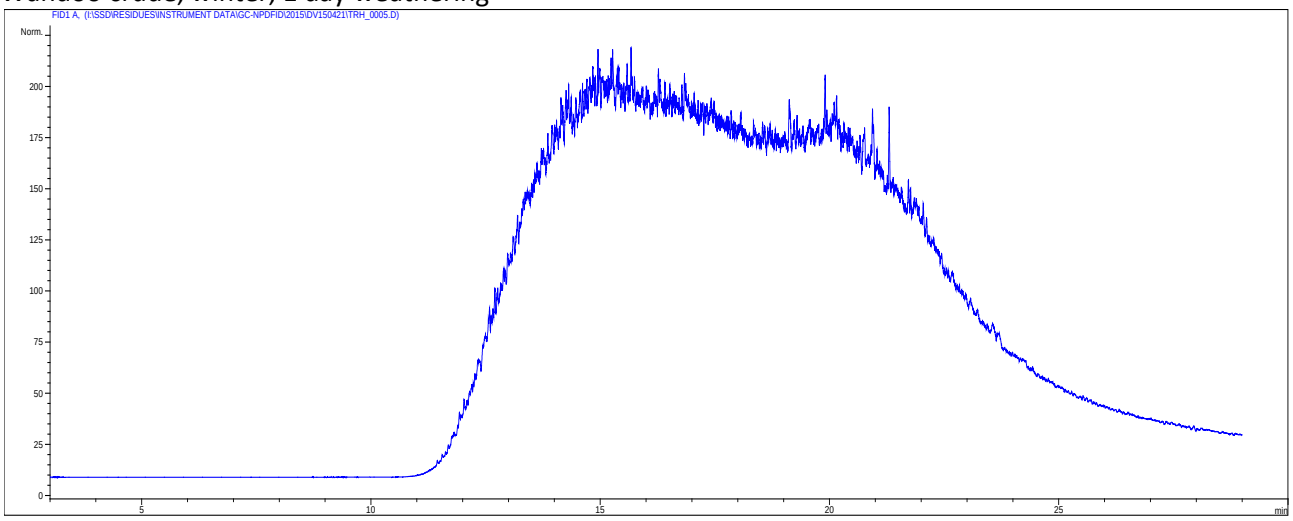
Wandoo crude, summer, 21 days weathering



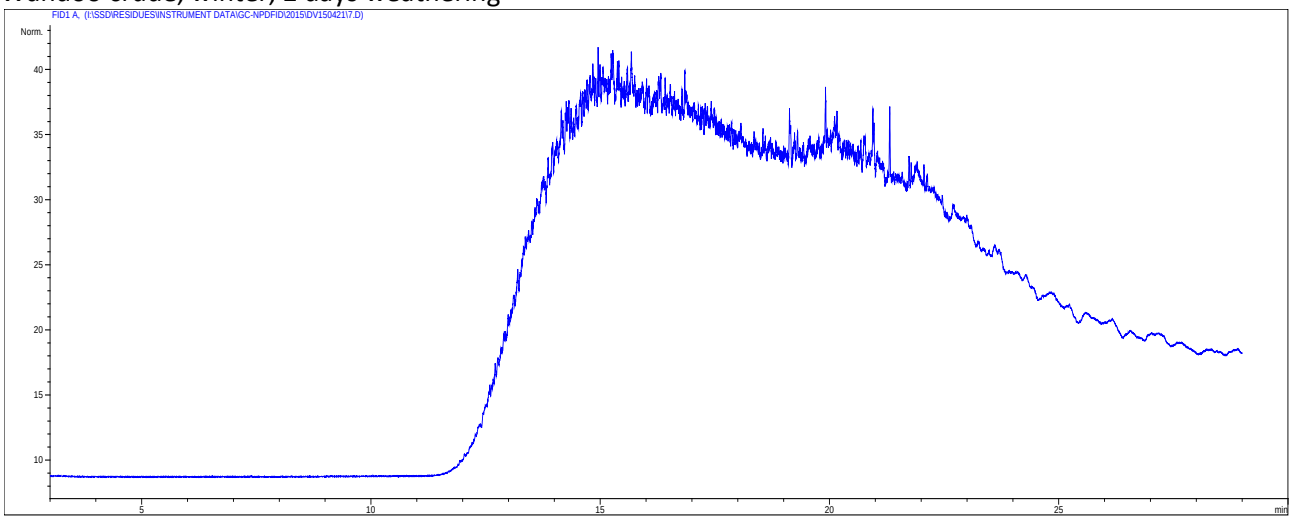
Fresh Wandoo crude



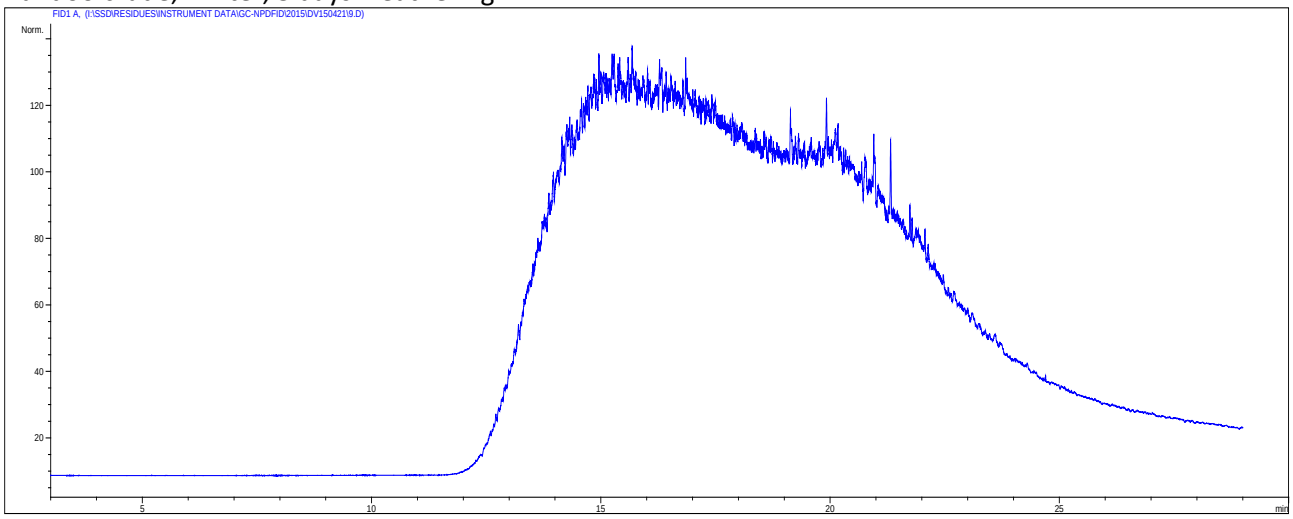
Wandoo crude, winter, 1 day weathering



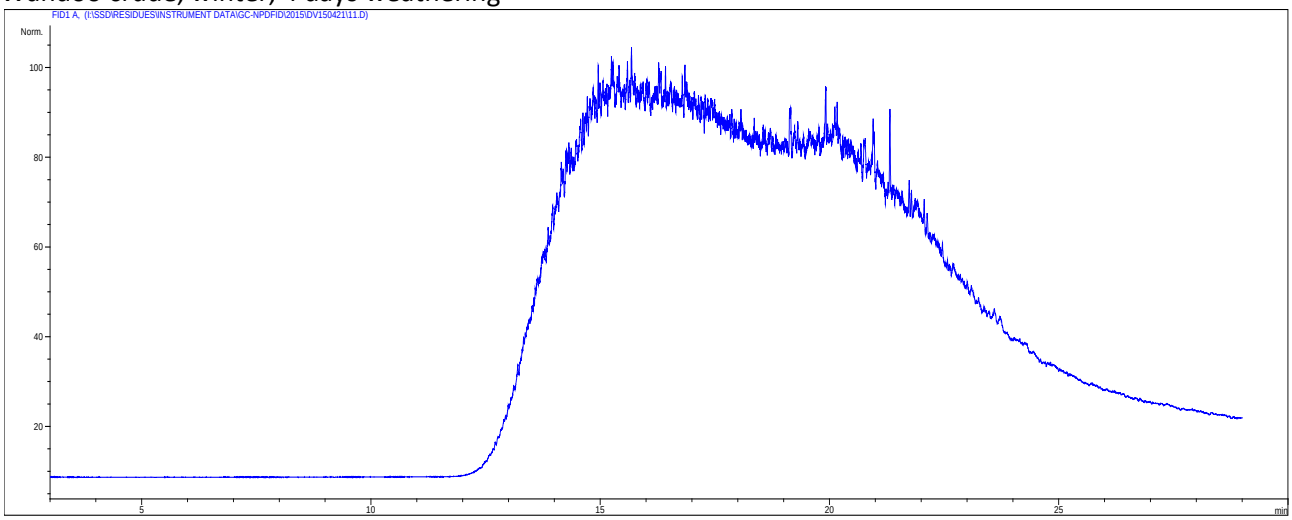
Wandoo crude, winter, 2 days weathering



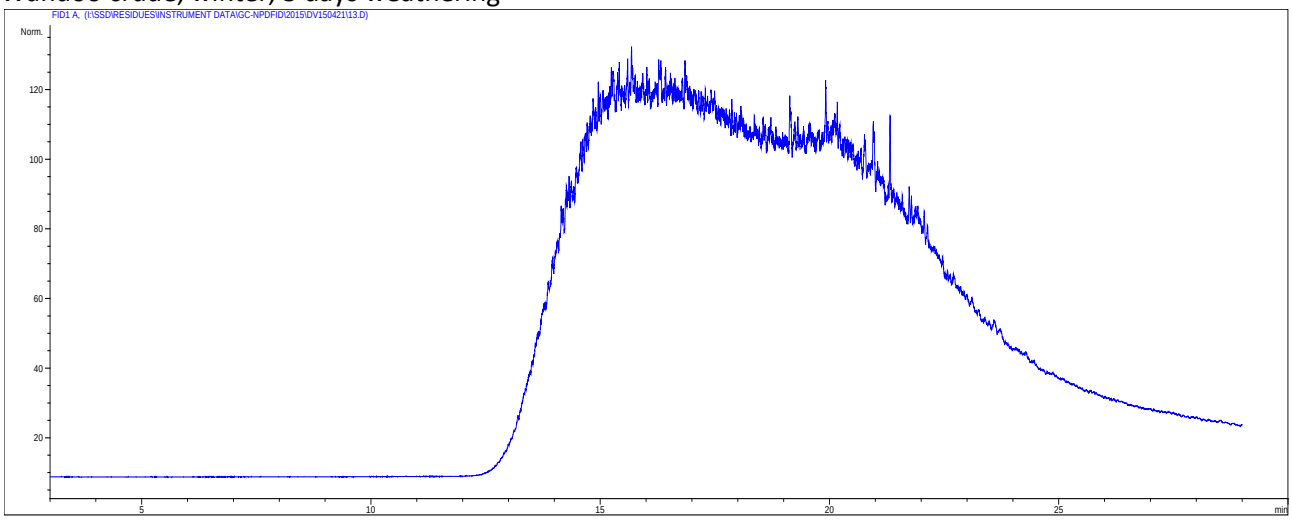
Wandoo crude, winter, 3 days weathering



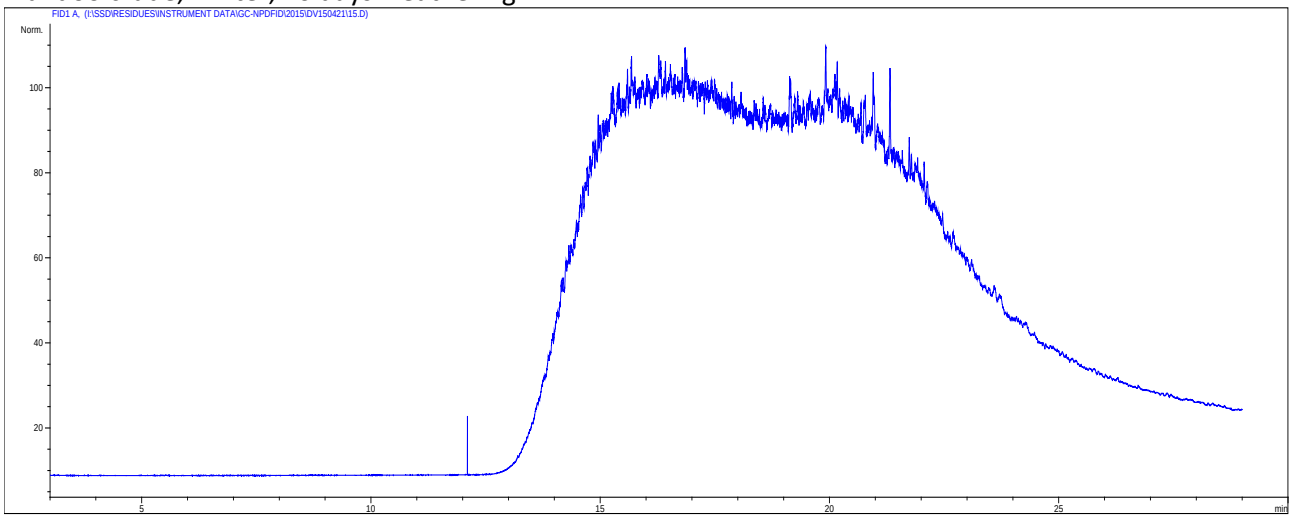
Wandoo crude, winter, 4 days weathering



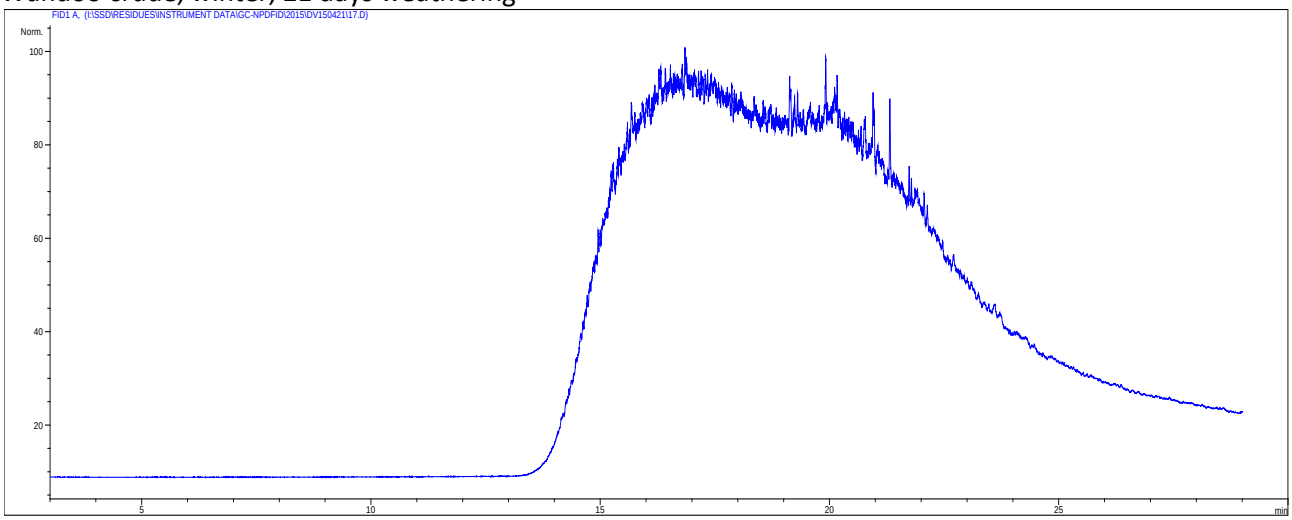
Wandoo crude, winter, 5 days weathering



Wandoo crude, winter, 10 days weathering



Wandoo crude, winter, 21 days weathering



Appendix B
WAN-2000-RD-0001.04 Wandoo Field Operational and Scientific Monitoring Bridging Implementation Plan

VERMILION
Oil & Gas
Australia Pty. Ltd.

VERMILION OIL & GAS AUSTRALIA

Operational and Scientific Monitoring Bridging Implementation Plan

VOG-1100-RG-0002

(formerly titled Wandoo Field Operational and Scientific Monitoring Plan [WAN-2000-RD-0001.03])

Revision	Date	Originator	Checker	Approver
0	28/02/2025	Mandy Walker	Sally Shepheard	Noel Bennett
		Oil Spill Response Coordinator	Environment Advisor	Operations Manager

Revision control sheet

KEEP THIS SHEET IN THE FRONT OF THE MANUAL

Revision	Date	Description	Originator	Checker	Approver
A	13/12/2024	Issued for Review	MW	SS	NB
0	28/02/2025	Issued for Use	MW	SS	NB

Document 'holds'

Items that have been recognised as requiring further development. These items are listed in the table below and will be addressed in the next revision of this document.

Section and heading	Page number

Distribution list

No.	Location	Title (if applicable)
1	VOGA Perth Office Document Control – Electronic Master	
2	Wandoo B Platform – Electronic Copy	
3	VOGA Intranet – Electronic Copy	
4	Wandoo B Platform – HSE MS Library	

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References

Document Number	Title
WPA-7000-YH-0007	Wandoo Facility Environment Plan
WPA-7000-YH-0001	Wandoo Well Construction EP
WAN-2000-RD-0001.01	Wandoo Field Oil Spill Contingency Plan – Planning and Preparedness
WAN-2000-RD-0001.02	Wandoo Field Oil Spill Contingency Plan Document 2 – Oil Pollution Emergency Plan
WAN-2000-RD-0001.03	VOGA Operational and Scientific Monitoring Plan
VOG-7000-RH-0009	VOGA Oil Spill Response Capability Review
VOG-7000-RH-0008	VOGA Emergency Response Logistics Management Plan

Overview

This Operational and Scientific Monitoring Bridging Implementation Plan is presented in two parts:

- Part A: Preparedness outlines the relationship between Vermilion Oil and Gas Australia (Vermilion) environmental management document framework and the Joint Industry Operational and Scientific Monitoring (OSM) Framework (APPEA, 2021).
- Part B Implementation provides operationally focussed guidance for Vermilion personnel and OSM Service Providers and/or sub-contracted Monitoring Service Providers to coordinate the implementation of monitoring plans.

Part A Preparedness

Preparedness outlines the relationship between Vermilion Oil and Gas Australia (Vermilion) environmental management document framework and the Joint Industry Operational and Scientific Monitoring (OSM) Framework (APPEA, 2021).

Section 1 Introduction

OSM is a key component of the environmental management document framework supporting offshore petroleum activities, alongside Environment Plans (EP) and Oil Pollution Emergency Plans (OPEP). Vermilion has elected to use the Joint Industry OSM Framework and supporting operational monitoring plans (OMPs) and scientific monitoring plans (SMPs) as the foundation of its OSM approach. The Joint Industry OSM Framework is available on the Australian Energy Producers (AEP) Environment Publications Webpage.

The framework contains two primary monitoring components; operational monitoring (OM) and scientific monitoring (SM). OM aims to provide situational awareness of a hydrocarbon spill, enabling Incident Management Teams (ICT) to arrange timely and effective spill response and continually monitor the effectiveness of the response. SM is implemented to determine the extent, severity and persistence of environmental impacts from a hydrocarbon spill as well as inform potential remediation activities.

Use of the Joint Industry OSM Framework requires each Titleholder to develop a Bridging Implementation Plan (BIP) (this Plan) which fully describes how the Framework interfaces with the Titleholder's own activities, spill risks, OSM capability and internal management systems. To support transition to the Joint Industry OSM Framework. The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) issued a Regulatory Advice Statement (RAS) to guide adoption of the Framework in August 2021.

This Plan describes Vermilion's activities, spill risks, and internal management systems and determines no reduction in performance standards or capability to manage risk in adoption of the Joint Industry OSM Framework.

Table 1-1 describes key documents that form Vermilion's environmental management framework. Note that this is not an exhaustive list and additional documents are listed in the activity specific Vermilion OPEPs.

Mobilisation of OSM should follow the process listed in Section 12 Mobilisation and activation .

Table 1-1: Key documents in Vermilion's environmental management framework

VOGA documents	Description
Activity specific Environment Plan (EP)	Each activity-specific EP describes the activity, location, the environment, the risks to the environment as a result of the activity and the associated management controls. Of particular relevance to this BIP, it identifies sensitive receptors, credible spill scenarios, potential impacts from hydrocarbon spills and the environment that may be affected (EMBA).
Activity specific Oil Pollution Emergency Plan (OPEP)	Each activity-specific OPEP provides the activation and response process for the credible spill scenarios, including incident management, and detailed implementation guidance for individual response strategies.
Vermilion Oil and Gas Australia Oil Spill Response Capability Review [VOG-7000-RH-0009]	The purpose of this document is to understand the required and current capability for VOGA's oil spill response preparedness. Capability is used in the context of this document as the arrangements, contracts, Memoranda of Understanding (MoU), directories and agreements in place with service providers and personnel who may be involved in response efforts for an oil spill incident.
Vermilion Oil and Gas Australia Emergency Response Logistics	This document contains details of contractors and service providers engaged to undertake oil spill response activities and supporting services such as transport and accommodation.

VOGA documents	Description
Management Plan [VOG-7000-RH-0008]	
Vermilion Oil and Gas Australia Wandoo Emergency Response Plan (ERP) [VOG-2000-RD-0017]	Outlines the emergency response procedures for Vermilion operations, including marine maintenance, and drilling and completions activities conducted in the Wandoo Field. It provides guidance on the initial response process, responder checklists, reference guides and Incident Command Team forms.
Vermilion Oil and Gas Australia Emergency Contact List [VOG-2000-RD-0050]	Contains all relevant contact and communications information to enable effective communication amongst the response personnel and external stakeholders, including relevant OSM contacts.

1.1 Scope

This Operational and Scientific Monitoring – Bridging Implementation Plan (OSM-BIP) addresses the requirements of the Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations 2023 (OPGGS (E) Regulations) for all Vermilion activities within the Wandoo Facility Environment Plan [WPA-7000-YH-0007] (Figure 1-1) and the Well Construction Environment Plan [WPA-7000-YH-0001] (Figure 1-1). This BIP applies to all Vermilion activities which have an EP accepted by Commonwealth and State regulators and supersedes Vermilion's Wandoo Field Operational and Scientific Monitoring Plan [WAN-2000-RD-0001.03].

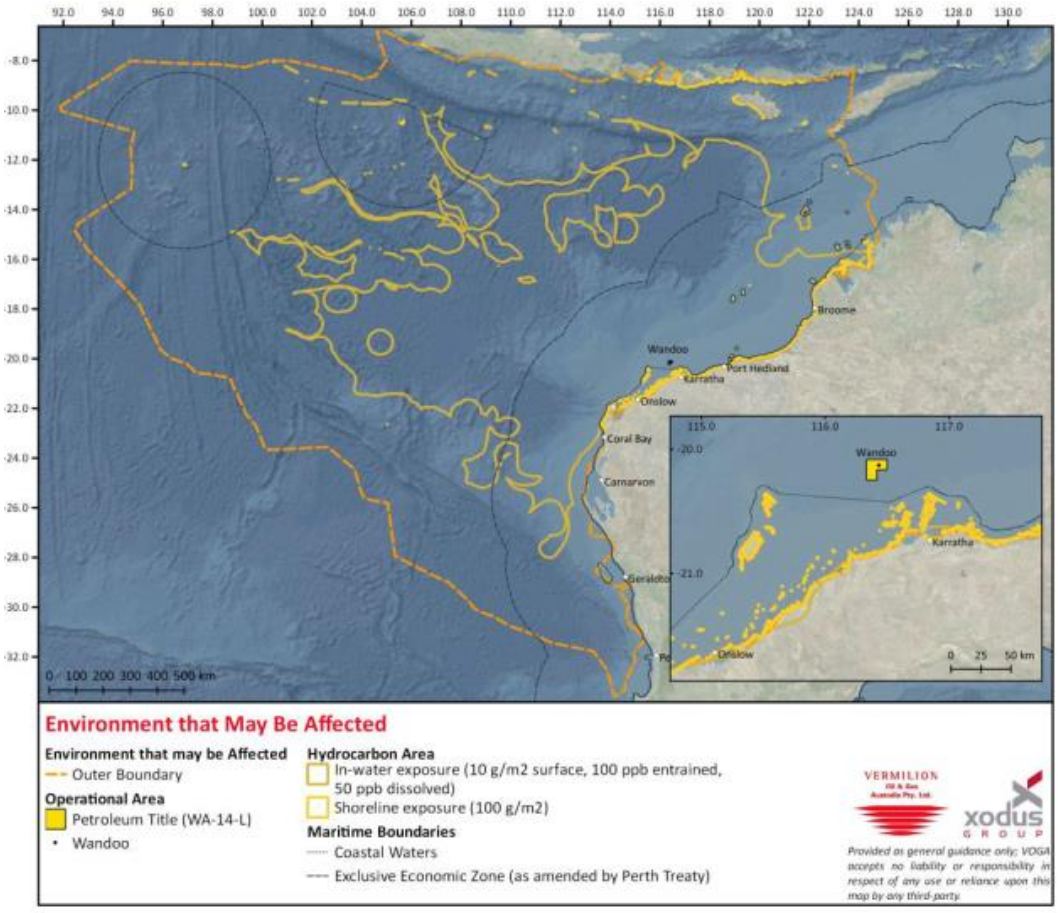

Figure 1-1 Environment that May Be Affected

A Field Change Management: Management of Change (MoC) Screening Checklist (No. 6642) has been compiled to document Vermilion's transition to, and adoption of, the Joint Industry OSM Framework via this OSM-BIP. This MoC also describes the process for replacing accepted SM and OM components within existing Vermilion OPEPs. It is accompanied by technical note Joint Industry OSM Gap Analysis [VOG-1000-RH-0037] , that contains a comparison of the OMPs and SMPs in the existing Operational and Scientific Monitoring Plan [WAN-2000-RD-0001.03] and the Joint Industry OSM Framework to ensure that performance and capability is not diminished by adoption of the framework.

For all new activities, there are three main steps for assessing whether this OSM-BIP adequately covers the OSM requirements for each new activity, these include the following:

- Determine if the new activity Environment that May be Affected (EMBA) fits within the OSM-BIP Combined EMBA, as outlined in Section 2.1.
- Determine the locations requiring a baseline review (as described in Section 2.2) and whether these locations are currently included in Table 2-2.
- Determine whether the capability requirements and monitoring arrangements of the new activity exceed or are met by the capability requirements outlined in Section 8 and capability arrangements described in Section 10 and Section 11.

Prior to submission for regulatory approval, each new/revised OPEP shall document whether the OSM-BIP adequately covers the OSM requirements as per the three elements described above. If additional operational and/or scientific monitoring capability is required for a new activity above the OSM capability described in Section 10, prior to submission the Environment/Project Team will follow Vermilion's EP MOC and risk assessment process, and the OSM-BIP will be updated with the new capability requirements before the activity commences

Vermilion will implement OSM, as applicable, for oil spills across both State and Commonwealth waters. In the event that control of scientific monitoring in State waters is taken over by the Western Australian Department of Transport (WA DoT) under advice from the State Environmental Scientific Coordinator (ESC), Vermilion will follow the direction of WA DoT as Control Agency and provide all necessary resources (monitoring personnel, equipment and planning) to assist as a supporting agency.

Section 2 EMBA and identification of locations for baseline review

2.1 Consolidated EMBA

This OSM-BIP provides monitoring guidance and arrangements for all activities referred to in Table 2-1. Therefore, a single consolidated EMBA has been prepared to represent all of these activities and the resultant geographical extent of this OSM-BIP. The consolidated EMBA corresponds to the low exposure values using stochastic modelling results applying the following thresholds:

- 1 g/m^2 floating oil thickness, which is considered to be below levels which would cause environmental harm and is more indicative of the areas perceived to be affected due to its visibility on the sea surface
- 10 g/m^2 for accumulated (shoreline) oil, which represents the area visibly contacted by the spill
- 10 ppb for dissolved hydrocarbons corresponds generally with potential for exceedance of water quality triggers
- 100 ppb entrained hydrocarbons represents the low exposure zone and corresponds generally with potential for exceedance of water quality triggers.

The Consolidated EMBA has been determined based on the modelling results for the activities and worst-case credible spill scenarios outlined in Table 2-1. These spill scenarios are considered representative of Vermilion's worst-case credible scenarios given the extent of their EMBAs, hydrocarbon type, proximity to receptors, minimum time to contact and their representation of Vermilion's operational locations.

For a description of the environment within each EMBA, refer to the activity-specific EPs. The activity-specific EPs include the following pertinent information: protected matters and any associated recovery plans/conservation advice, key ecological features (KEFs), protected areas, significant socio-economic industries, and culturally significant places.

2.2 Locations requiring a baseline review

Baseline monitoring provides information on the condition of ecological receptors prior to, or spatially independent (e.g. if used in control chart analyses) of, a spill event and is used for comparison with post-impact scientific monitoring, where required.

NOPSEMA OSMP Information Paper N-04750-IP1349 A343826 provides guidance on what is considered to be adequate environmental baseline. "*…an environmental baseline dataset may be considered adequate if it would allow the titleholder to confidently detect spill effects in view of natural background spatial and temporal variability, and determine the extent, severity and persistence of oil spill impacts on environmental values and sensitivities relevant to the area of interest*."

Locations requiring a baseline data review have been drawn from the worst-case spill scenarios listed in Table 2-1 and based on the stochastic modelling results of each activity. Locations and associated receptors requiring a baseline data review were identified as those sensitive receptors contacted by hydrocarbons at the low threshold for entrained (≤10 ppb), dissolved (≤10 ppb), floating (≤1 g/m^2), and shoreline contact (≤10 g/m^2), within 7 days (7 days was used to delineate the first-strike monitoring response) at a probability >5%. Table 2-2 provides a cumulative list of all the locations identified and Appendix A lists the key receptors/sensitivities associated with each of these locations.

Monitoring priorities are subsequently identified as those locations and associated receptors predicted to be contacted within 7 days at a probability >5%, and where baseline data is either not available or not sufficient (as depicted in Table 4-3 and outlined in Section 4).

Table 2-1: Vermilion worst-case spill scenarios used to determine the planning area for operational and scientific monitoring

Environment Plan / OPEP	Hydrocarbon Type	Scenario	Release Duration	Volume (m^3)
Wandoo Facility Environment Plan [WPA-7000-YH-0007] and Wandoo Field Oil Spill Contingency Plan [WAN-2000-RD-0001.02]	Wandoo Crude	Liquid hydrocarbon release from wells	68 days	4,364
	Wandoo Crude	Liquid hydrocarbon release from export equipment, submarine hose, floating hose or export flow lines	Instantaneous	10,000
	Wandoo Crude	Crude oil spill from the concrete gravity structure (CGS)	24 hours	39,750
	Heavy Fuel Oil	Tanker fuel spill	Instantaneous	1,300
	Marine Diesel Oil (MDO)	Vessel collision	Instantaneous	700
	Wandoo Crude	Loss of crude from export system	Instantaneous	300
Wandoo Well Construction Environment Plan [WPA-7000-YH-0001]	Wandoo Crude	Loss of well control (LOWC)	43 days	25,555

Table 2-2: Locations in the EMBA requiring a baseline review (all locations predicted to be contacted within 7 days at the low thresholds and a probability >5% from all worst-case scenarios presented in Table 2-1)

Grouping	
Australian Marine Parks	
Dampier MP	
Gascoyne MP	
Montebello MP	
Shorelines	
Barrow Island Group	Boodie Island
	Middle Island
Bedout Island	
Dampier Archipelago (Includes RPS oil spill modelling default receptor locations of Cape Bruguieres, Cohen Island, Dolphin Island, Eaglehawk Island, Enderby Island, Gidley Island, Goodwyn Island, Keast Island, Kendrew Island, Legendre Island, Malus Island, Rosemary Island and West Lewis Island)	
Karratha (Includes RPS oil spill modelling default receptor locations of Middle Pilbara – Islands and Shoreline, and Northern Pilbara – Islands and Shoreline)	
Lowendal Islands	
Pilbara Coast Islands Group	Angel Island
	Passage Island
Montebello Islands	
Regnard Island	
State Marine Parks	
Barrow Island MMA	
Barrow Island MP (State)	
Montebello Island MP	
Nature Reserves	
Great Sandy Island NR	
Reefs, Shoals and Banks (RSB)	
Brewis Reef*	
Fortescue Reef*	
Golmar Shoals*	
Madeleine Shoals*	
O'Grady Shoal*	
Rankin Bank*	
Ripple Shoals*	
Tryal Rocks*	

**Submerged receptor*

Section 3 Baseline information

Vermilion has access to a number of different baseline data sources that are relevant to the high-value receptors in the EMBA. These include the Vermilion protected matters data (including habitat/fauna information) and the following external data sources:

3.1 Data.gov.au

Data.gov.au is the central source of Australian open government data published by federal, state and local government agencies. In addition, it includes publicly-funded research data and datasets from private institutions that are in the public interest.

3.2 Australian Ocean Data Network

The Australian Ocean Data Network (AODN) is the primary access point for search, discovery, access and download of data collected by the Australian marine community. Data is presented as a regional view of all the data available from the AODN. Primary datasets are contributed to by Commonwealth Government agencies, State Government agencies, Universities, the Integrated Marine Observing System (IMOS – an Australian Government Research Infrastructure project), and the Western Australian Marine Science Institution (WAMSI).

3.3 Western Australian Oil Spill Response Atlas

The Western Australian Oil Spill Response Atlas (OSRA) is a spatial database of environmental, logistical and oil spill response data. Using a geographical information system (GIS) platform, OSRA displays datasets collated from a range of custodians allowing decision makers to visualise environmental sensitivities and response considerations in a selected location. Oil spill trajectory modelling (OSTM) can be overlaid to assist in determining protection priorities, establishing suitable response strategies and identifying available resources for both contingency and incident planning. OSRA is managed by the Oil Spill Response Coordination unit within the WA DoT Marine Safety and is part funded through the National Plan for Maritime Environmental Emergencies and the Australian Maritime Safety Authority (AMSA). Vermilion ICT members can log in to the OSRA here.

3.4 The Atlas of Living Australia

The Atlas of Living Australia (ALA) is a collaborative, online, open resource that contains information on all the known species in Australia aggregated from a wide range of data providers. It provides a searchable database when considering species within the EMBA. The ALA receives support from the Australian Government through the National Collaborative Research Infrastructure Strategy and is hosted by the Commonwealth Scientific and Industrial Research Organisation (CSIRO).

3.5 Index of Marine Surveys Assessment

The Index of Marine Surveys for Assessments (IMSA) is an online portal to information about marine-based environmental surveys in Western Australia. IMSA is a project of the WA Department of Water and Environmental Regulation (DWER) for the systematic capture and sharing of marine data created as part of an environmental impact assessment.

3.6 Other sources

Other sources include:

- The Protected Matters Search Tool Department of Climate Change, Energy, the Environment and Water (DCCEEW)
- the WA Department of Biodiversity and Attractions (DBCA) Biodiversity and Conservation Science Annual Reports;
- Australian Institute for Marine Science (AIMS) Research Data Platform;
- WA State of Fisheries Report;
- eAtlas.org.au;
- North West Atlas;
- Western Australian Marine Science Institution;
- Geosciences Australia data and publications;
- Australian Marine Parks Science Atlas; and
- Birdlife Data Zone.

Reports and peer reviewed journal articles were also accessed via research and journal databases such as PubMed and Google Scholar, as well as unpublished monitoring reports. A list of baseline data sources is provided in Appendix B: OSM baseline data sources.

Section 4 Baseline data review

During a spill event, the first-strike monitoring capability will be prioritised to those receptors with insufficient baseline data (deemed first-strike monitoring priorities) to collect baseline data post-spill pre-impact. An overview of the process used to identify first-strike monitoring priorities is outlined in **Error! R eference source not found.**. Where post-spill pre-impact monitoring is not feasible due to short contact times, understanding which receptors have insufficient baseline data will help quickly guide the finalisation of each SMP design and the need to include alternative designs (e.g., the Gradient Approach versus Before-After Control-Impact (BACI) design).

The baseline data assessment includes the following steps:

1. **Identification of locations requiring a baseline review:** Receptor locations predicted to be contacted within 7 days, at a probability greater than 5%, are identified and aligned with OMPs and SMPs.

2. **Collection of baseline data:** Environmental baseline monitoring data relevant to the locations and receptors is located (as per sources outlined in Section 3).

3. **Assessment of baseline data:** The relevance of each data source is assessed:

    a. For each data source obtained, a meta-analysis is performed to determine if the parameters and methods align with the key parameters and methods outlined in the Joint Industry SMPs (Table 4-1), the spatial extent of the data, the sampling effort/duration, and the temporal relevance is also noted. Table 4-2 outlines the overall assessment criteria used for each data source.

4. **Assessment of baseline data:** Regular evaluation of the adequacy (in terms of the likely ability to detect changes between pre-impact and post-impact conditions) of the collective baseline data for each location and associated receptors is undertaken. This evaluation takes into consideration the following:

    a. Background historical information on the presence, distribution, seasonality, and if applicable, the reproductive state of the receptor (as outlined in Appendix A) is compared with the data available from monitoring within the last 5 years. Depending on the receptor and associated Joint Industry SMP, the following is considered:

    b. Does the data collectively cover the required spatial extent of the receptor within a location (taking into consideration any background historical information on the distribution of the receptor)?

    c. Does the data collectively cover all the species/biological communities required for the relevant Joint Industry SMP and that may be present at the location?

5. **Assessment outcome:** Each location and associated receptor is then categorised as either ‘First-Strike Monitoring Priority’ or ‘Lower Priority for First-Strike Monitoring’, as outlined below, and summarised in Table 4-3:

a. First-Strike Monitoring Priority – current baseline data is not in place, not suitable or not sufficient; and post-spill pre-impact baseline data collection should be prioritised.

b. Lower Priority for First-Strike Monitoring – collectively there is substantial baseline data or on-going monitoring from within the last 5 years. This data aligns with the key parameters and methodologies of the relevant Joint Industry SMP, encompasses the required species/biological communities, and covers the required spatial extent of the location. The current baseline data is therefore considered sufficient and could likely be used to detect a level of change in the event of a significant impact. Hence this receptor is considered a lower priority for post-spill, pre-impact data collection.

During a spill, the monitoring priorities will vary according to the spill event and it should be noted that the monitoring priorities provided in Table 4-3 are listed for planning and guidance purposes only (note: the first-strike monitoring priorities listed are a cumulative list based on all the worst-case spill scenarios outlined in Table 2-1).

Further prioritisation of monitoring should focus on locations most at risk of consequences, such as in shallow waters, in sensitive habitats, and in areas with protected species. Consequently, shorelines and adjacent nearshore areas will generally take priority over reefs, shoals and banks, unless they are the main locations impacted by the spill event. In the event of a spill Vermilion will work with its OSM Service Provider, sub-contracted Monitoring Service Providers, and key stakeholders in the initial stages of the spill to identify priority monitoring receptors. This will assist in the finalisation of the monitoring design, ensuring that resources are allocated appropriately and according to the greatest risk of impact. This process is outlined in Section 13.

It is noted that it is difficult to obtain absolute statistical proof of oil spill impacts, due to the variability (spatially and temporally) of the natural environment, the lack of experimental control due to the nature of spills and the availability of suitable baseline data (Kirby, *et al*. 2018).

Alternative approaches exist for detecting impacts where post-spill, pre-impact monitoring may not be feasible. These include impact versus control design approaches and/or a gradient approach. The Joint Industry OSM Framework provides guidance and considerations for survey designs to enable the acquisition of sufficiently powerful data during SMP implementation.

Once SMP monitoring reports are drafted (post-spill) they will be peer reviewed by an expert panel as per Section 10.10 of the Joint Industry OSM Framework.

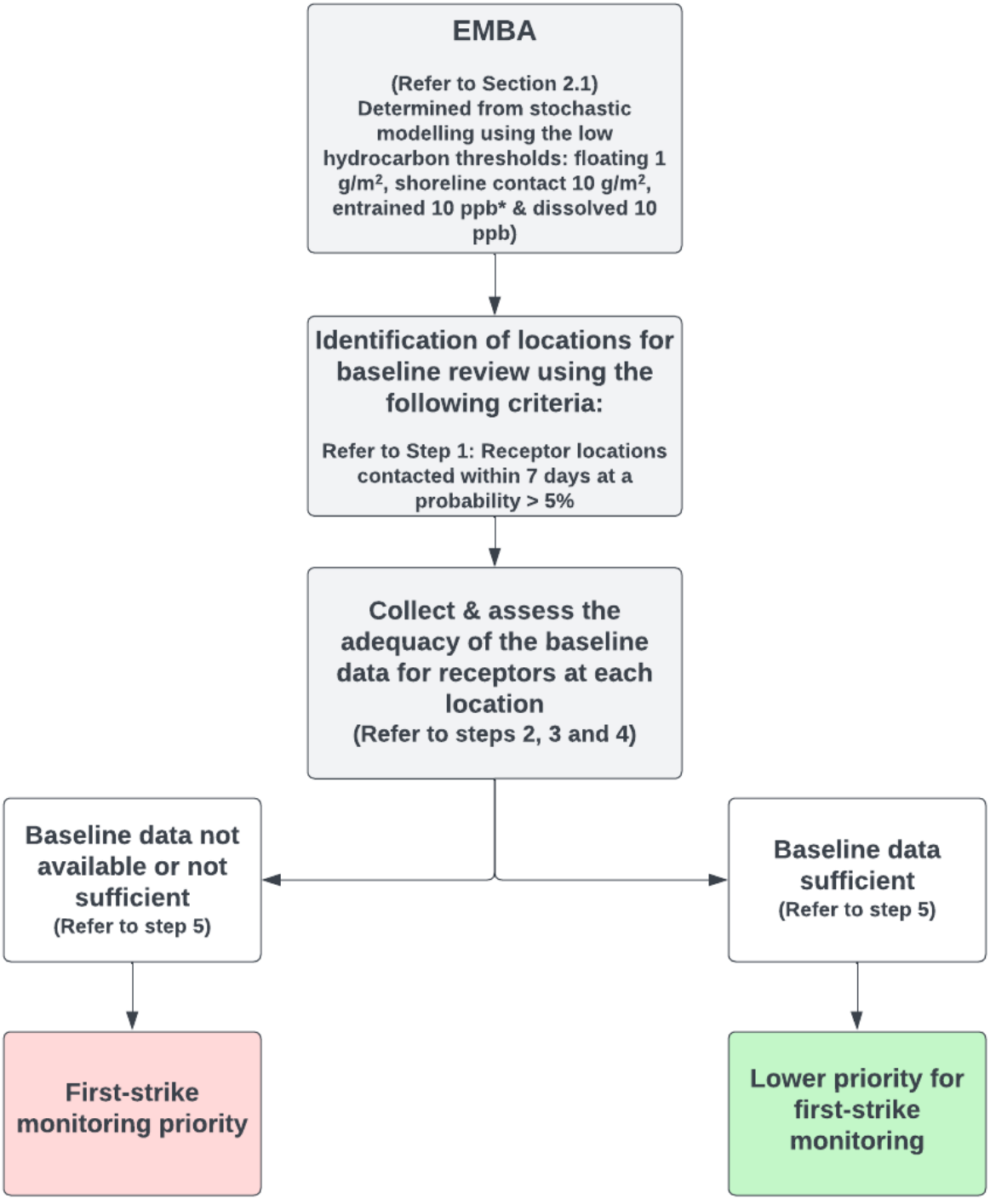

Figure 4-1: Summary of the process for identifying first-strike monitoring priorities

Table 4-1: Key parameters and key methodology from the Joint Industry SMPs

SMP	Key parameter	Key methodology
SMP1 Water quality impact assessment	At least one key parameter: • Total recoverable hydrocarbons (TRH); • Total petroleum hydrocarbons (TPH); • Benzene, toluene, ethylbenzene and xylenes and naphthalene (BTEXN); or • Polycyclic aromatic hydrocarbons (PAH)	In situ UV fluorometer and/or samples analysed at National Association of Testing Authorities (NATA) accredited lab using NATA accredited method
SMP2 Sediment quality impact assessment	At least one key parameter: TRH, TPH, BTEXN, PAH, heavy metals	Sediment collected by corer/grab and samples analysed at NATA accredited lab using NATA accredited method
SMP3 Intertidal and coastal habitat assessment	At least one key parameter: presence, diversity, distribution	Any of the following, as appropriate to the parameters: • Ground and vessel-based intertidal surveys (e.g. quadrats, transects, including video and still photography) • Remote sensing • Infauna sampling
SMP4 Seabirds and shorebirds	At least one key parameter: species present, abundance / counts, behaviour (resting, roosting, foraging, nesting)	Ground surveys and standardised methodology for counting birds
SMP5 Marine megafauna - reptile	At least one key parameter: species identification, abundance / counts, key behaviour (foraging, mating, nesting, internesting)	As appropriate to the species and behaviour / life stage: • Nesting turtles: ground surveys • In water turtles: vessel and aerial surveys • Sea snakes: manta board and snorkel surveys Estuarine crocodiles: vessel-based spotlight surveys at night
SMP5 Marine megafauna- whale sharks, dugong and cetaceans	At least one key parameter: species identification, abundance / counts, key behaviour	Aerial or vessel surveys, acoustic monitoring
SMP6 Benthic habitat assessment	At least one key parameter: presence, diversity, distribution	Any of the following, as appropriate to the parameters: • Transects • Towed camera • Drop camera • Remotely Operated Vehicle (ROV) camera • Diver-based camera surveys

SMP	Key parameter	Key methodology
		• Remote sensing (coral & seagrass broad scale survey) • Sediment grab for infauna
SMP7 Marine fish and elasmobranch assemblages assessment	At least one key parameter: species identification, abundance, habitat type	Any of the following, as appropriate to the parameters: • Baited remote underwater video stations (BRUVS) • Stereo Baited Remote Underwater Video Stations (SBRUVS) • ROV • Towed video survey
SMP8 Fisheries impact assessment	At least one key parameter: Abundance, catch-rate, stock structure, size structure	Catch and effort for stock assessment

Table 4-2: Assessment criteria for baseline data review

Year of most recent data capture	Duration of monitoring program	Frequency of data capture	Similarity of methods to Joint Industry SMP	Similarity of parameters to Joint Industry SMP
High = 2019–2024	High = >4 years	High = 4+ sampling trips per year	High	High
Medium = 2013–2018	Medium = 2–4 years	Medium = 2–3 sampling trips per year	-	-
Low = <2012	Low = <2 years	Low = one-off sampling trip	Low	Low

Table 4-3: Recommended priority monitoring locations versus SMPs

Grouping / Location	SMP									
	Water quality impact assessment	Sediment quality impact assessment	Intertidal and coastal habitat assessment	Seabirds and shorebirds	Marine megafauna assessment – reptiles	Marine megafauna assessment – whale sharks, dugong and cetaceans	Benthic habitat assessment	Marine fish and elasmobranch assemblages assessment	Fisheries impact assessment	Heritage and social impact assessment
Barrow Islands Group					Flatback turtle					
Bedout Island										
Dampier Archipelago			Mangroves							
Karratha					Flatback turtle					
Lowendal Islands				Shearwater	Turtles at Varanus Island					
Pilbara Coast Islands Group										
Montebello Islands										
Regnard Island										
RSB			NA							
Key										
	First-strike monitoring priority									
	Lower priority for first-strike monitoring									

Section 5 OSM organisational structure

Vermilion's Incident Command Team (ICT) runs an incident control system analogous to the Australasian Inter-Service Incident Management System (AIIMS) to which the National Plan is also aligned, as described in the activity EPs and/or OPEPs. The ICT will be responsible for coordinating OSM activities, which will be implemented by the Planning Section within the ICT, with support from each ICT Section, in particular the Operations Section.

The Vermilion ICT structure is shown in **Error! Reference source not found.**. The ICT Incident Commander is u ltimately accountable for managing the response operation, which includes this plan. Depending on the scale of the event, individual people may perform multiple roles; similarly, multiple people may share the same role.

In the event that a spill crosses into state waters where the WA DoT is the Control Agency, the ICT will be managed through coordinated command and Vermilion will continue monitoring activities in State waters, with oversight from the WA DoT.

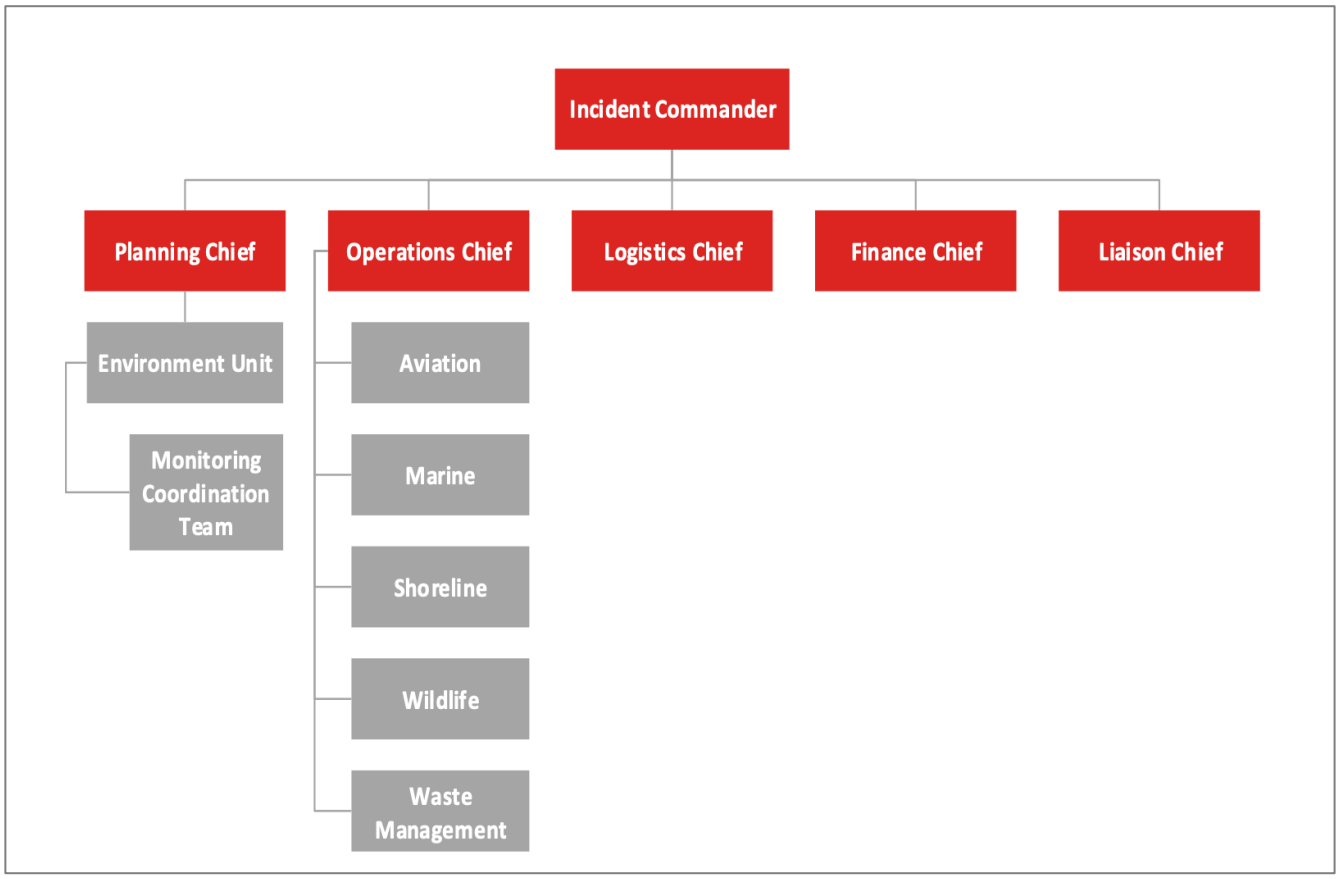

Figure 5-1: Vermilion ICT structure

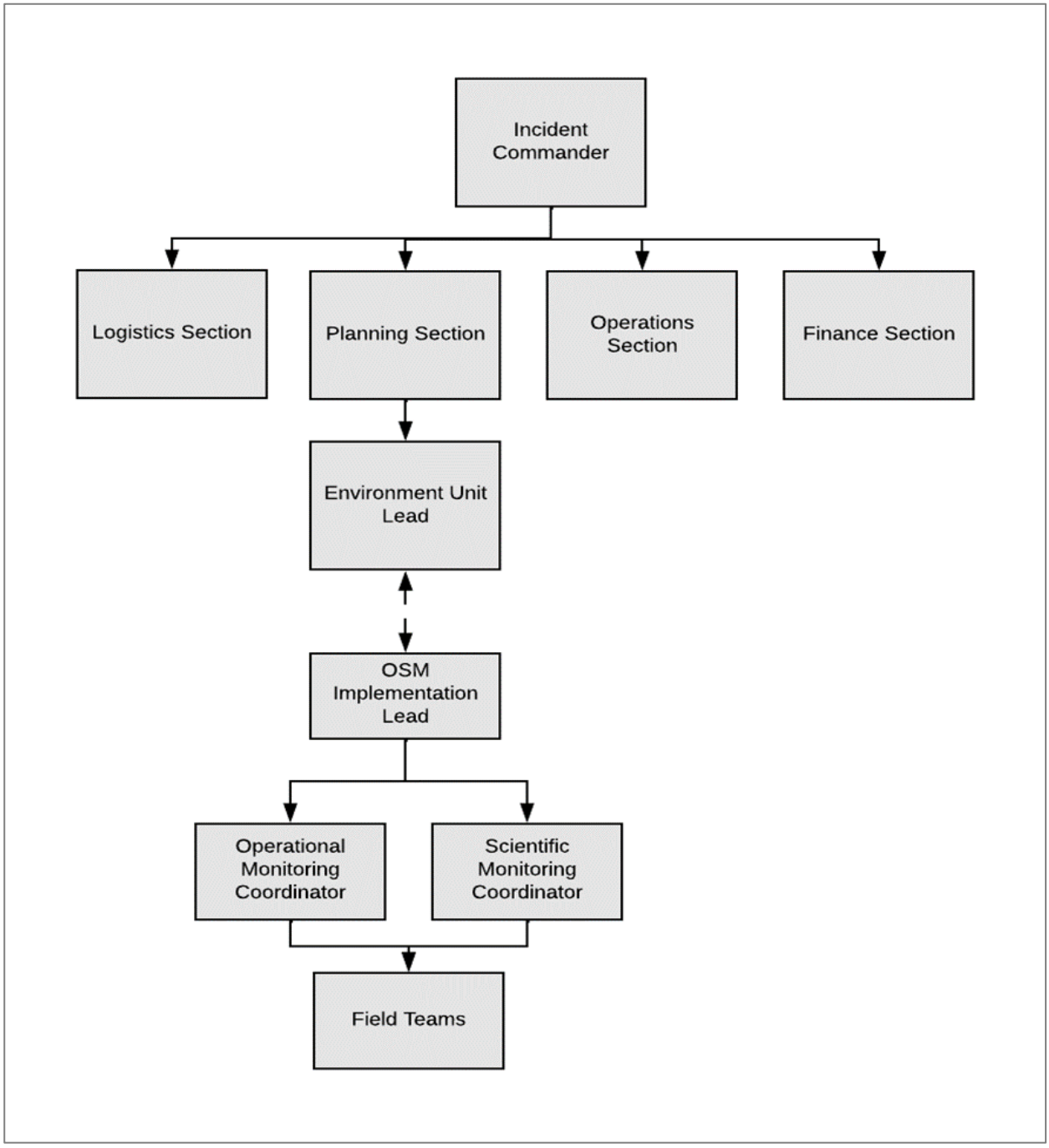

Figure 5-2: Vermilion ICT structure with OSM team

Section 6 OSM roles and responsibilities

OSM roles and responsibilities are listed in Section 10.13.2 of the Joint Industry OSM Framework. Table 6-1 outlines the OSM roles held by Vermilion and the OSM Service Provider.

During the post-response phase the Environment Unit Lead and the OSM Service Provider OSM Implementation Lead will continue to be responsible for the coordination and delivery of monitoring plans.

Table 6-1: Roles and responsibilities for OSM

Role	Held by
Environment Unit Lead	Vermilion (ICT)
OSM Implementation Lead	OSM Service Provider
Operational Monitoring Coordinator and/or Scientific Monitoring Coordinator	OSM Service Provider
OM and/or SM Group Supervisors and Managers	Vermilion / OSM Service Provider
OSM Field Teams	OSM Service Provider

Section 7 Mobilisation and timing of OMP and SMP implementation

Table 7-1 provides an indicative implementation schedule for OMPs and SMPs in the BIP Consolidated EMBA and adjacent waters. 'Implementation' of an OMP/SMP is defined as being ready, at the point of staging or departure, to mobilise for monitoring. If the monitoring plan is desktop-based, implementation is defined as commencing the work (e.g. computer model inputs).

Refer to activity specific EPs for an indication of worst-case minimum contact times based on stochastic modelling (stochastic modelling represents all possible outcomes that could potentially occur). Due to short contact times, there may be instances where post-spill pre-impact monitoring is not feasible. For these locations, and where baseline data does not exist, or may not be recent and applicable, the application of a BACI design may not be possible. The finalisation of each SMP design will consider this and may need to include alternative designs (e.g. data from an expected BACI design may need to be analysed as a Gradient Approach).

Table 7-1: Indicative OMP and SMP implementation schedule for OSM activities if initiation criteria are met

Proximity to spill source	Monitoring type	0–48 hours from OSM activation	Within 72 hours of OSM activation	~5-7 days from OSM activation	1-2 weeks from OSM activation	Ongoing
Spill site and surrounding waters	OM	Activation of OM Team Leads. Finalise OMPs. Commence activation and mobilisation of OM personnel.	• OMP1: Hydrocarbon Properties And Weathering Behaviour, where resources are available (e.g. Supply Vessel with onboard sampling equipment). • OMP2: Water Quality Assessment • OMP3: Sediment Quality Assessment • OMP5: Marine Fauna Assessment • OMP4a: Surface Chemical Dispersant Effectiveness (commencing with Tier 1 SMART Protocol) • Continue to finalise OMPs. • Continue to activate and mobilise OM personnel.	Continued (as per on-going arrangements)	Continued (as per on-going arrangements)	As results from implemented OMPs are available, data are provided to relevant personnel in ICT (e.g. Planning) and used in the Incident Action Planning process for the next operational period. OMP is redesigned or reallocated according to the specifics of the actual spill.
	SM	Commence activation and mobilisation process.	• Continue to activate and mobilise personnel. • Work on finalising SMPs.	• SMP1: Water quality impact assessment • SMP2: Sediment quality impact assessment	Continued.	Continue SMP monitoring until termination criteria are met

Proximity to spill source	Monitoring type	0–48 hours from OSM activation	Within 72 hours of OSM activation	~5-7 days from OSM activation	1-2 weeks from OSM activation	Ongoing
		Activation of SMP Team Leads.		• SMP6: Benthic Habitat Assessment • SMP7: Marine fish and elasmobranch assemblages assessment		
Sensitive receptors (including shorelines, reefs, banks and shoals) predicted to be contacted within 7 days	OM	Activation of OMP Team Leads. Finalise OMPs. Commence activation and mobilisation of OM personnel.	• OMP1: Hydrocarbon properties and weathering behaviour at sea • OMP2: Water quality assessment • OMP3: Sediment quality assessment • OMP6: Shoreline clean-up assessment • OMP5: Marine fauna assessment • Continue to finalise OMPs. • Continue to activate and mobilise OM personnel.	Continued (as per on-going arrangements)	Continued (as per on-going arrangements)	As results from implemented OMPs are available, data are provided to relevant personnel in ICT (i.e. Planning) and used in the Incident Action Planning process for the next operational period. OMP is redesigned or reallocated according to the specifics of the actual spill until termination criteria are met
	SM	Activation of SMP Team Leads and finalisation of SMPs	Continue to activate and mobilise personnel. Work on finalising SMPs.	• SMP1: Water Quality Impact Assessment • SMP2: Sediment Quality Impact Assessment • SMP6: Benthic Habitat Assessment	Continued.	Continue SMP implementation until termination criteria are met.

Proximity to spill source	Monitoring type	0–48 hours from OSM activation	Within 72 hours of OSM activation	~5-7 days from OSM activation	1-2 weeks from OSM activation	Ongoing
				• SMP3: Intertidal and Coastal Habitat Assessment • SMP4: Seabirds and Shorebirds • SMP5: Marine Mega-fauna Assessment-Reptiles • SMP5: Marine Mega-fauna Assessment-Cetaceans, Whale Sharks, Dugong • SMP7: Marine Fish and Elasmobranch Assemblages assessment • SMP8: Commercial and recreational fisheries impact assessment • SMP9: Heritage Assessment • SMP10: Social Impact Assessment		
Sensitive receptors (including shorelines, reefs, banks and shoals) predicted to be	OM	-	-	• Additional Activation of OM Team Leads. • Commence activation and mobilisation of additional OM personnel.	• Continue to finalise OMPs. • Continue to activate and mobilise OM personnel. • OMP: Hydrocarbon properties and	As results from implemented OMPs are available, data are provided to relevant personnel in ICT (i.e. Planning) and used in the Incident Action

Proximity to spill source	Monitoring type	0–48 hours from OSM activation	Within 72 hours of OSM activation	~5-7 days from OSM activation	1-2 weeks from OSM activation	Ongoing
contacted week 1-2					weathering behaviour at sea • OMP2: Water quality assessment • OMP3: Sediment quality assessment • OMP6: Shoreline clean-up assessment • OMP5: Marine fauna assessment	Planning process for the next operational period. OMP is redesigned or reallocated according to the specifics of the actual spill until termination criteria are met
	SM	-	-	• Additional Activation of SM Team Leads. • Commence activation and mobilisation of additional SM personnel.	• SMP1: Water quality impact assessment • SMP2: Sediment quality impact assessment • SMP5: Marine Mega-fauna assessment - reptiles • SMP7: Marine fish and elasmobranch assemblages assessment • SMP3: Intertidal and coastal habitat assessment • SMP4: Seabirds and shorebirds • SMP6: Benthic habitat assessment	Continue SMP monitoring until termination criteria are met

Proximity to spill source	Monitoring type	0–48 hours from OSM activation	Within 72 hours of OSM activation	~5-7 days from OSM activation	1-2 weeks from OSM activation	Ongoing
					• SMP8: Commercial and recreational fisheries impact assessment • SMP9: Heritage Assessment • SMP10: Social Impact Assessment	

Section 8 Resourcing requirements

To guide resourcing requirements, the spill scenario most likely to require the greatest first-strike and on-going capability was selected from those informing the EMBA. Selection was based on stochastic modelling results (refer to Table 2-1), focussing on the scenario with the greatest predicted number of locations contacted at the low thresholds (Section 2.1) within 7 days; followed by the greatest number of locations contacted within 7-14 days; and at the highest contact probabilities.

Other factors influencing the selection of the scenario with the highest resource requirements were location of the spill, proximity to receptors, and hydrocarbon properties. The LOWC scenario of a 25,555 m^3 release of Wandoo Crude over 43 days was determined to be Vermilion's worst-case spill scenario requiring the greatest OSM resources. To further guide first-strike resource requirements for OSM, deterministic modelling was undertaken and the run with the most receptors was selected where shoreline accumulation exceeded 10 g/m^2 within 7 days. Run 34 of Vermilion's LOWC deterministic modelling met these parameters as well as the contact to additional receptors within 7–14 days (Table 8-1).

Table 8-1: Deterministic modelling results based on a 25,555 m^3 surface release of Wandoo Crude over 43 days

Receptors	Minimum arrival time (days) for deterministic realisation No. 34			
	Shoreline accumulation ≥10 g/m^2	Floating hydrocarbons ≥1 g/m^2	Entrained hydrocarbons ≥10 ppb	Dissolved hydrocarbons ≥10 ppb
Kendrew Island#	5.00	4.79	4.50	NC
Goodwyn Island#	5.17	4.92	5.00	NC
Enderby Island#	5.00	4.96	5.00	NC
Rosemary Island#	5.04	4.96	4.92	NC
Karratha	5.38	5.04	5.54	NC
Passage Islands^	4.96	5.04	4.54	NC
O'Grady Shoal*	NA	5.04	6.13	NC
South East Reef*	NA	5.04	6.42	NC
Eaglehawk Island#	6.04	5.17	5.00	NC
Malus Island#	6.00	5.58	6.38	NC
Fortescue Reef*	NA	5.67	5.63	NC
West Lewis Island#	6.04	5.96	6.17	NC
Legendre Island#	6.50	6.42	6.42	13.92
Cohen Island#	6.50	6.50	6.42	13.42
Madeline Shoals*	NA	6.5	6.46	NC
Dampier AMP*	NA	6.5	6.25	NC
Cape Bruguieres#	9.08	6.63	6.46	NC
Gidley Island#	9.21	6.75	6.54	NC
Keast Island#	7.04	6.79	6.46	NC
Dolphin Island #	9.13	7.71	7.0	NC
Angel Island^	9.42	9.33	8.58	NC
Conzinc Island#	10.29	10.13	9.17	NC

Receptors	Minimum arrival time (days) for deterministic realisation No. 34			
	Shoreline accumulation ≥10 g/m²	Floating hydrocarbons ≥1 g/m²	Entrained hydrocarbons ≥10 ppb	Dissolved hydrocarbons ≥10 ppb
Eliassen Rocks*	NA	10.96	7.54	NC
East Lewis Island#	6.42	11.17	9.17	NC
Glomar Shoal*	NA	16.5	5.42	NC
Montebello AMP*	NA	16.63	1.58	23.33
Delambre Island#	11.58	19.58	18	NC
Haury Island#	14.88	21	11.88	NC
Rankin Bank*	NA	31.21	23.42	NC
Gascoyne AMP*	NA	48.88	34.96	52.58
Ningaloo AMP*	NA	49.46	35.42	52.75

** Submerged receptor that has no features above the sea surface. Modelling indicates 'contact' with these receptors when the hydrocarbons pass over the receptor on the sea surface.*

 # Part of the Dampier Archipelago

^ Part of the Pilbara Coast Islands Group

NC: No contact to receptor predicted for specified threshold

NA: Not applicable

The resources required to assist the ICT in the coordination and management of OSM are outlined in Table 8-2. Whilst the resources required to commence operational and scientific monitoring components during weeks 1–2 are presented in Table 8-3 and Table 8-4 respectively.

Table 8-3 and Table 8-4 are based on the requirement for baseline review provided in Section 2.2, the implementation schedule outlined in Table 7-1, and the worst-case deterministic trajectory (LOWC Run 34) outlined in Table 8-1.

If required, additional resources will be mobilised from weeks 2-3 onwards via the OSM Service Provider Contract, which includes provision of scale-up resources.

Note: Each new activity will be assessed, as outlined in Section 1, to determine whether spill scenario(s) exceed the resourcing requirements of Run 34 - Loss of Well Control scenario of 25,555 m^3 of Wandoo Crude over 43 days.

Table 8-2: Resources required for key OSM coordination roles

Role	Resources required	Arrangement
OSM Implementation Lead (OSM Monitoring Provider/s)	1 x OSM Implementation Lead	Oil Spill Response Limited (OSRL) OSM Supplementary Service Agreement
Operational Monitoring Coordinator and Scientific Monitoring Coordinator (OSM Service Provider/s)	1 x Operational Monitoring Coordinator 1 x Scientific Monitoring Coordinator	
OSM Field Operations Manager (OSM Service Provider/s)	1 x OSM Field Operations Manager	

Table 8-3: Resources required for implementing operational monitoring plans

OMP	Week 1 (total)	Week 2 (total)	Arrangement
OMP1 Hydrocarbon properties and weathering behaviour at sea)*	1 team (spill site and surrounds) 1 team per site (e.g. for worst-case estimating as per Table 8-1 this amounts to 4 sites [Dampier Archipelago, Karratha, Pilbara Coast Islands Group, and associated RSB in the vicinity]) Total 5 teams Note: can initially be performed by the same team as OMP: Water quality assessment. This SMP may replace OMP: Water quality assessment if the OMPs termination criteria are triggered	1 team (spill site and surrounds) 1 team per site (e.g. for worst-case estimating as per Table 8-1 this amounts to 5 sites [Dampier Archipelago (x2), Karratha, Pilbara Coast Islands Group and associated RSB in the vicinity]) Total 6 teams Note: can initially be performed by the same team as OMP: Water quality assessment. This SMP may replace OMP: Water quality assessment if the OMPs termination criteria are triggered	OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement
OMP6 Shoreline clean-up assessment	Detail on resources required for SCAT are presented in the activity-specific OPEP and Vermilion Oil and Gas Australia Oil Spill Response Capability Review [VOG-7000-RH-0009].		AMOSC Master Services Agreement (MSA) and/or OSRL OSM Supplementary Service Agreement Marine contractors

OMP	Week 1 (total)	Week 2 (total)	Arrangement
			State/Territory Response Teams and AMSA National Response Team
OMP4a Surface chemical dispersant effectiveness and fate	1 team for visual observations, which may be performed by trained aerial observers used during monitor and evaluate if trained in observation and verification of chemical dispersant effectiveness For water quality observations, refer to OMP: Water quality assessment		OSRL OSM Supplementary Service Agreement AMOSC MSA Marine contractors
OMP2 Water quality assessment*	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea resourcing* (all sites)		OSRL OSM Supplementary Service Agreement Marine contractors
OMP3 Sediment quality assessment*	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea resourcing* (all sites)		OSRL OSM Supplementary Service Agreement Marine contractors
OMP5 Rapid marine fauna assessment	1 team to conduct initial aerial surveys for all sites (2 observers per aircraft) Note: these resources may not be required if relevant scientific monitoring components initiation criteria have been triggered.		OSRL OSM Supplementary Service Agreement Marine contractors Aviation contractors

** Initial co-mobilisation between OMP: Hydrocarbon properties and weathering behaviour at sea, OMP: Surface chemical dispersant effectiveness and fate, OMP: Water quality assessment and OMP: Sediment quality assessment*

Table 8-4: Resources required for implementing scientific monitoring plans

SMP	Week 1 (total)	Week 2 (total)	Arrangement
SMP1 Water quality impact assessment	1 team (spill site and surrounds) 1 team per site (e.g. for worst-case estimating as per Table 8-1 this amounts to 4 sites [Dampier Archipelago, Karratha, Pilbara Coast Islands Group, and associated RSB in the vicinity]) Total 5 teams	1 team (spill site and surrounds) 1 team per site (e.g. for worst-case estimating as per Table 8-1 this amounts to 6 sites [Dampier Archipelago (x2 teams), Karratha, Pilbara Coast Islands Group, and associated RSB in the vicinity]) Total 6 teams	OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement

SMP	Week 1 (total)	Week 2 (total)	Arrangement
	Note: can initially be performed by the same team as OMP: Water quality assessment. This SMP may replace OMP: Water quality assessment if the OMPs termination criteria are triggered	Note: can initially be performed by the same team as OMP: Water quality assessment. This SMP may replace OMP: Water quality assessment if the OMPs termination criteria are triggered	
SMP2 Sediment quality impact assessment	Refer to SMP: Water quality impact assessment* (all sites)		OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement
SMP3 Intertidal and coastal habitat assessment	1 team per site (e.g. for worst-case estimating as per Table 8-1 this amounts to 3 sites [Dampier Archipelago, Karratha, Pilbara Coast Islands Group]) Total 3 teams	1 team per site (e.g. for worst-case estimating as per Table 8-1 this amounts to 4 sites [Dampier Archipelago (x2 teams), Karratha, Pilbara Coast Islands Group]) Total 4 teams	OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement
SMP4 Seabirds and shorebirds	Based on worst-case estimating as per Table 8-1: 1 team to conduct initial aerial surveys for Dampier Archipelago and Karratha 1 team to conduct initial aerial surveys for Pilbara Coast Islands Group Total 2 aerial teams Note: can initially be performed by the same team as OMP: Marine fauna assessment – seabirds and shorebirds. This SMP may replace OMP: Marine fauna assessment –	Based on worst-case estimating as per Table 8-1: 1 team to conduct aerial surveys for Dampier Archipelago and Karratha 1 team to conduct aerial surveys for Pilbara Coast Islands Group (Can initially be performed by the same aerial team as OMP: Marine fauna assessment) Total 2 aerial teams 1 team to conduct vessel-based surveys per site (Dampier Archipelago (x2 teams), Karratha, Pilbara Coast Islands Group and associated RSB in the vicinity (surveys	OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement

SMP	Week 1 (total)	Week 2 (total)	Arrangement
	seabirds and shorebirds if the OMPs termination criteria are triggered	would include all fauna [birds, reptiles, cetaceans, dugong and whale shark]) Total 5 vessel-based teams 1 team to conduct ground-based surveys per site (Dampier Archipelago (x2), Karratha, Pilbara Coast Islands Group)* (1 experienced ornithologists per team) Total 4 ground-based teams	
SMP5 Marine megafauna assessment (whale shark, dugong and cetaceans)	Aerial surveys refer to SMP: Seabirds and shorebirds This SMP may replace the relevant OMP: Marine fauna assessment if the OMPs termination criteria are triggered	Aerial surveys refer to SMP: Seabirds and shorebirds Vessel surveys refer to SMP: Seabird and shorebirds	OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement
SMP5 Marine mega-fauna assessment (reptiles)	Aerial surveys refer to SMP: Seabirds and shorebirds This SMP may replace the relevant OMP: Marine fauna assessment if the OMPs termination criteria are triggered	Aerial surveys refer to SMP: Seabirds and shorebirds Vessel surveys refer to SMP: Seabird and shorebirds Ground based survey refer to SMP: Seabird and shorebirds (including 1 member experienced with ground turtle surveys)	OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement
SMP6 Benthic habitat assessment	1 team (spill site and surrounds) 1 team per site (e.g. for worst-case estimating as per Table 8-1 this	1 team (spill site and surrounds) 1 team per site (e.g. for worst-case estimating as per Table 8-1 this	OSRL OSM Supplementary Service Agreement Marine contractors

SMP	Week 1 (total)	Week 2 (total)	Arrangement
	amounts to 4 sites [Dampier Archipelago, Karratha, Pilbara Coast Islands Group, and associated RSB in the vicinity]) Total 5 teams	amounts to 5 sites [Dampier Archipelago (x2 teams), Karratha, Pilbara Coast Islands Group, and associated RSB in the vicinity]) Total 6 teams	Laboratory arrangement
SMP7 Marine fish and elasmobranch assemblages assessment	1 team (spill site and surrounds) 1 team per site (e.g. for worst-case estimating as per Table 8-1 this amounts to 4 sites [Dampier Archipelago, Karratha, Pilbara Coast Islands Group, and associated RSB in the vicinity]) Total 5 teams	1 team (spill site and surrounds) 1 team per site (e.g. for worst-case estimating as per Table 8-1 this amounts to 5 sites [Dampier Archipelago (x2 teams), Karratha, Pilbara Coast Islands Group, and associated RSB in the vicinity]) Total 6 teams	OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement
SMP8 Fisheries impact assessment	Total 2 teams to cover all relevant Commonwealth and State fisheries		OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement
SMP9 Heritage features assessment	1 team	1 team	OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement
SMP10 Social impact assessment	1 team	1 team	OSRL OSM Supplementary Service Agreement Marine contractors Laboratory arrangement

** Initial co-mobilisation between OMP: Hydrocarbon properties and weathering behaviour at sea, OMP: Water quality assessment and OMP: Sediment quality assessment*

 # During capability assessment, available personnel were allocated to one monitoring team only

Section 9 Capability demonstration

Vermilion is a Member of the OSRL OSM Supplementary Service Agreement (SA), which provides shared OSM Annual Services and Response Services to members who have subscribed to this supplementary service. This OSM Supplementary SA includes access to the OSRL (referred to in this document as OSM Service Provider) sub-contracted Monitoring Service Providers within Australia and internationally (who will report through the OSM Service Provider) to deliver monitoring capability.

The OSM Service Provider prepares a monthly Capability Register which is available to all Members. The Capability Register details available personnel and competencies in support of OM/SM services which may be activated by Members. Details of OSM services available through the OSM Supplementary SA are provided in Table 9-1 below.

Table 9-1: OSM service provider preparedness and activation / monitoring services

OSM Services Provided During Preparedness and Activation / Monitoring Phases
Preparedness[1]
24/7 Duty Manager accessed through 24 hour Hotline
Provision of suitably trained operational monitoring personnel
Monthly reports on personnel and equipment availability
Access to OSM Service Provider's subcontracted Monitoring Service Providers
Access to OSM Service Provider's network of laboratories and equipment providers
Activation / Monitoring[2]
Provision of an OSM Services Lead and OSM Implementation Lead to the Vermilion ICT within 12 hours of notification
Provision of a first-strike monitoring team within 72 hours of notification, ready to deploy from a nominated port(s) or staging location (e.g. Forward Operating Base [FOB])
Finalisation of monitoring plans
Provision of scientific monitoring personnel within 5-7 days of notification
Access to OSM Service Provider laboratories and equipment

9.1 Personnel competencies

The training and competencies held by key OSM personnel via the OSM Supplementary SA are consistent with the specified training and competencies stated in Table 11-1 of the Joint Industry OSM Framework (APPEA, 2021). Demonstration of competency is provided through the Service Providers OSM Document Management System.

If required, Vermilion will engage additional subject matter experts in the initial stages of the monitoring program to assist in activation and mobilisation of monitoring teams and support the OSM Service Provider in the preparation of monitoring designs.

[1] Defined as Annual OSM Services in OSM Supplementary Service Agreement

[2] Defined as Response Services in OSM Supplementary Service Agreement

9.2 Equipment

Equipment requirements for each OMP and SMP are listed by each OMPs and SMPs within the OSM Framework (APPEA, 2021). Vermilion will remain responsible for support and field logistics, including monitoring platforms (e.g. vessels, vehicles and aircraft), flights, accommodation, and transportation/couriers for samples to be sent back to laboratories.

Availability of key equipment is listed in the OSM Service Provider's Equipment Register, available via the OSM Service Providers MSP Capability Register. A generalised breakdown of Vermilion's equipment and the source is listed in provided in Table 9-2.

Table 9-2: Vermilion OSM equipment

Equipment type	Source
Vermilion acquired equipment	
Desktop equipment (e.g. Oil Spill Response Atlas)	Coordinated through ICT
Water quality rapid response kit: • 1 x oil spill sampling kit • 2 x oil spill sampling nets • Extendable sampling pole • 1 x Niskin bottle • Deionised water • Wash bottles • 100 amber hydrocarbon jars • 100 m dyneema rope • General items – bubble wrap, tape, Chain of Custody forms, brushes for decontamination etc	Vermilion owned, located at the Toll Dampier Supply Base
Logistical equipment (e.g. in-field accommodation, vessels, aircraft)	Refer to list of external support agencies and contracts held by Vermilion as listed in the VOGA Emergency Response Logistics Management Plan [VOG-7000-RH-0008].
Dispersant shake test kits (initial shake jar test only)	2 x test kits in Fremantle; 2 x test kits in Karratha. Available through the National Plan.

9.3 Exercises

The OSM Service Provider is contracted conduct OSM Services Annual Assurance Programs. As part of this program, the OSM Service Provider conducts numerous exercises, which are outlined in Table 9-3 below. The purpose of this testing is to confirm that response arrangements and planned capability is in place , available when needed, and function as intended.

Following the Notification and Tabletop exercises listed in Table 9-3, the OSM Service Provider will prepare exercise reports and track any action items to complete. The reports will be available to all Members. In addition, Vermilion will conduct an annual notification test of the OSM Service Provider, outlined in the Vermilion Emergency Response Schedule [VOG-1100-YH-0001].

Table 9-3: Exercise types

Exercise Type	Description	Frequency
Assurance Program Workshop	The outputs from the annual OSM Services and Assurance Program Workshop will form the basis of the OSM Annual Services and Assurance Program for the coming Contract Year.	Annually
Notification exercise	Test procedures to notify and activate the OSM Services, including subcontracted Monitoring Service Providers.	Annually
Tabletop exercise	A discussion-based exercise that involves no physical deployment of personnel or equipment. The exercise will simulate all actions to validate the enactment of plans, procedures, protocols, roles and tasks during a simulated incident.	Annually
Desktop review	A desktop review of capability for any OMP and/or SMP not tested during the annual table-top exercise. The review can also be based on the outcomes/findings of the OMPs and/or SMPs that were tested.	Annually

Section 10 Capability assessment

Table 10-1 provides a comparison of Vermilion's worst-case OSM resource requirements (as outlined in Table 8-3 and Table 8-4) with the OSRL OSM Supplementary Service Agreement capability to implement each OMP and SMP. Where there are synergies between OMPs and SMPs, the same personnel may implement multiple OMPs/SMPs simultaneously, as identified in Table 10-1. For example, personnel assigned to the OMP for Hydrocarbon Properties and Weathering Behaviour at Sea can also carry out the OMPs for Water Quality Assessment and Sediment Quality Assessment concurrently. During the capability assessment, available personnel were allocated to one monitoring team only to ensure capability is met despite synergies between OMP and SMP personnel.

This information has been transcribed across to the VOGA Oil Spill Response Capability Review [VOG-7000-RH-0009].

Table 10-1: OSM capability

Component	Total personnel required (Weeks 1–2) [3]	Personnel available via OSM Service Provider	Personnel available via OSROs	Vermilion	Total personnel available
OSM Personnel embedded in IMT	1 OSM Implementation Lead 1 OM Coordinator 1 SM Coordinator 1 OSM Field Operations Manager	1 OSM Implementation Lead 1 OM Coordinator 1 SM Coordinator 1 OSM Field Operations Manager	-	1 OSM Implementation Lead (initial)	1 OSM Implementation Leads 1 OM Coordinator 1 SM Coordinator 1 OSM Field Operations Manager
OMPs					
OMP1 Hydrocarbon properties and weathering behaviour at sea*	6 teams	7 teams#	-	Initial sampling kits (Toll Dampier Supply Base) and procedures for untrained personnel to obtain samples	7 teams
OMP6 Shoreline clean-up assessment	10 teams	18 OSRL SCAT specialists, plus additional team members trained in week 1 via SCAT E-learning training course being administered via the OSM Supplementary SA	60+ AMOSC Industry Core Group 12 AMOSC staff trained in SCAT		90 people (45 teams if resourced at 2 personnel per team; 30 teams if resourced at 3 personnel per team)

** Initial co-mobilisation between OMP: Hydrocarbon properties and weathering behaviour at sea, OMP: Water quality assessment and OMP: Sediment quality assessment*

 # During capability assessment, available personnel were allocated to one monitoring team only

[3] If additional resources are required for week 3 onwards then this will be identified early in the monitoring process and Vermilion will activate additional contracted resources through its OSM Services Provider to increase capacity

Component	Total personnel required (Weeks 1–2) [3]	Personnel available via OSM Service Provider	Personnel available via OSROs	Vermilion	Total personnel available
OMP4a Surface chemical dispersant effectiveness and fate	Visual observations: 1 team Water quality assessment – refer to OMP: Water quality assessment	1 visual observation team[#] Refer to OMP: Water quality assessment	4 AMOSC Staff 2 AMOSC Core Group trained personnel	-	Visual observations: 1 team (OSM Service Provider) 4 AMOSC Staff 2 AMOSC Core Group trained personnel
OMP2 Water quality assessment*	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea				
OMP3 Sediment quality assessment*	Refer to OMP: Hydrocarbon properties and weathering behaviour at sea				
OMP5 Marine fauna assessment	1 aerial team	1 team[#]	N/A	N/A	1 team
SMPs					
SMP1 Water quality impact assessment	6 teams Note: can initially be performed by the same team as OMP: Water quality assessment. This SMP may replace OMP: Water quality assessment if the OMPs termination criteria are triggered	7 teams[#]	-	-	7 teams
SMP2 Sediment quality impact assessment	Refer to SMP: Water quality impact assessment* (all sites)				
SMP3 Intertidal and coastal habitat assessment	4 teams	6 teams[#]	-	-	6 teams

Component	Total personnel required (Weeks 1–2) [3]	Personnel available via OSM Service Provider	Personnel available via OSROs	Vermilion	Total personnel available
SMP4 Seabirds and shorebirds	2 aerial teams 2 observers per aircraft Note: can initially be performed by the same team as OMP: Marine fauna assessment – seabirds and shorebirds. This SMP may replace OMP: Marine fauna assessment – seabirds and shorebirds if the OMPs termination criteria are triggered 5 vessel teams (surveys would include all fauna [birds, reptiles, cetaceans, dugong and whale shark]) 4 ground-based teams	2 aerial teams[#] 6 vessel teams[#] 6 ground based teams (plus 1 team member per team experienced with ground turtle surveys – see Marine mega-fauna assessment [reptiles]) [#]	-	-	2 aerial teams 6 vessel teams 6 ground based teams (plus 1 team member per team experienced with ground turtle surveys – see Marine mega-fauna assessment [reptiles])
SMP5 Marine mega-fauna assessment (whale shark, dugong and cetaceans)	Refer to SMP: seabirds and shorebirds				
SMP5 Marine mega-fauna assessment (reptiles)	Aerial and vessel - Refer to SMP: seabirds and shorebirds Ground surveys - Refer to SMP: seabirds and shorebirds (plus 1 team member per team	Refer to SMP: seabirds and shorebirds			

Component	Total personnel required (Weeks 1–2) [3]	Personnel available via OSM Service Provider	Personnel available via OSROs	Vermilion	Total personnel available
	experienced with ground turtle surveys)				
SMP6 Benthic habitat assessment	6 teams	7 teams#	-	-	7 teams
SMP7 Marine fish and elasmobranch assemblages assessment	6 teams	7 teams#	-	-	7 teams
SMP8 Fisheries impact assessment	2 teams	2 teams#	-	-	2 teams
SMP9 Heritage features assessment	1 team	1 team#	-	-	1 team
SMP10 Social impact assessment	1 team	1 team#	-	-	1 team

** Initial co-mobilisation between OMP: Hydrocarbon properties and weathering behaviour at sea, OMP: Water quality assessment and OMP: Sediment quality assessment*

 # During capability assessment, available personnel were allocated to one monitoring team only

[3] If additional resources are required for week 3 onwards then this will be identified early in the monitoring process and Vermilion will activate additional contracted resources through its OSM Services Provider to increase capacity

Section 11 Review of plan

As part of Vermilion's annual oil spill capability review, this document will be reviewed and revised as required, in accordance with Section 8.3.1 *Determining requirements* of the Wandoo Field Oil Spill Contingency Plan – Planning and Preparedness [WAN-2000-RD-0001.01]. This could include changes required in response to one or more of the following:

- When major changes have occurred which affect Operational and/or Scientific Monitoring coordination or capabilities (e.g. change of services provider);
- Changes to the activity that affect Operational and/or Scientific Monitoring coordination or capabilities (e.g. a significant increase in spill risk);
- Changes to legislative context related to Operational and/or Scientific Monitoring (e.g. *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act] protected maters requirements);
- Following routine testing of the OSM if improvements or corrections are identified; or
- After a Level 2/3 spill incident.

The extent of changes made to this OSM BIP and resultant requirements for regulatory resubmission will be informed by the relevant Commonwealth regulations, i.e. OPGGS (E) Regulations.

Part B Implementation

Control Agencies and Jurisdictional Authorities

Vermilion's EPs provide detailed information on Control Agency responsibilities, and should be referred to when planning operational and scientific monitoring activities, particularly in WA State Waters and along WA shorelines. Where the WA DoT is the Control Agency, OMP: Shoreline Clean-up Assessment will be implemented under their direction, with resources provided by Vermilion.

In addition, Part 4 of the Wandoo Field OSCP Document 2 Oil Pollution Emergency Plan [WAN-2000-RD-0001.02] titled activation of oil pollution emergency plan: activation and notification flowcharts ,provide regulatory and stakeholder notification and reporting requirements. Whilst all notification and reporting will be performed by Vermilion's ICT personnel, monitoring personnel should be aware of these requirements, and confirm all relevant notifications and reporting have been completed prior to undertaking monitoring activities.

Section 12 Mobilisation and activation

The Vermilion ICT Environment Unit Lead is responsible for initiating the activation of OSM components, subject to authorisation from the Incident Commander. Table 12-1 outlines the OSM Supplementary SA activation process to be followed by Vermilion and the OSM service providers.

Table 12-1: OSM mobilisation and activation process

Responsibility	Task	Timeframe	Complete
Environment Unit Lead (Vermilion)	Review initiation criteria of OMPs and SMPs (provided in Table 9-1 (OMPs) and Table 9-2 (SMPs) of the Joint Industry Operational and Scientific Monitoring Framework) during the preparation of the initial Incident Action Plan (IAPs) and subsequent IAPs; and if any criteria are met, activate relevant OMPs and SMPs	Within 4 hours of spill notification	☐
	Obtain authorisation from Incident Commander to activate OSM Service Provider	Within 4 hours of spill notification	☐
	Contact OSM Service Provider and verbally notify their Duty Manager of the incident, requesting provision of OSM Implementation Lead (if required by Vermilion) to the ICT. Complete Call Off Order Form (Appendix C) and submit to OSM Services Provider[4] to confirm activation of OSM Services	Within 4 hours of spill notification	☐
	Provide monitor and evaluate data (e.g. aerial surveillance, fate and weathering modelling, tracking buoy data, current IAPs) to OSM Services Provider	Within 1 hour of data being received by ICT	☐
	Liaise with Vermilion's Logistics Section Chief to identify potential staging and departure location/s for monitoring activities. Provide this information to OSM Services Provider	Within 4–6 hours of spill notification	☐
	Record tasks in Personal Log	At time of completion of task	☐
Logistics Section Chief (Vermilion)	Commence arrangements for vessels, accommodation and transport to mobilise monitoring teams	Within 24 hours of spill notification	☐
OSM Service Provider	Duty Manager to activate relevant Monitoring Service Providers	Within 30 minutes of Call Off Order Form being received by OSM Services Provider	☐
	OSM personnel (OSM Implementation Lead and OM/SM Coordinators) requested by Titleholder (via Call Off Order Form) to be sent to Titleholder's ICT	Within 12 hours of notification being made to	☐

[4] A copy of the Call Off Order Form is provided in Appendix C; however, the OSRL Duty Manager will send an updated version upon verbal notification.

Responsibility	Task	Timeframe	Complete
		OSM Services Provider	
	Liaise directly with the Environment Unit Lead to confirm which OMPs and SMPs are to be fully activated	Within 4 hours of monitor and evaluate data being received from ICT	☐
	Confirm availability of initial personnel and equipment resources	Within 5 hours of monitor and evaluate data being received from ICT	☐

Section 13 Monitoring priorities

As described in Section 2 and Section 4 of this Plan, the available stochastic spill modelling has been analysed to understand the likely first-strike monitoring priorities. Table 4-3 provides a summary of available baseline data for receptors, to assist in identifying where post-spill, pre-impact monitoring should be prioritised.

The monitoring priorities provided in Section 2 and Table 4-3 are to be used for guidance when confirming monitoring priorities in consultation with key stakeholders and sub-contracted Monitoring Service Providers (including subject matter experts, where available) in the event of a spill. Table 13-1 provides a checklist to assist in the confirmation of monitoring priorities for individual spills.

Table 13-1: Checklist for determining monitoring priorities

Responsibility	Task	Timeframe	Complete
Vermilion Environment Unit Lead	Evaluate monitoring priorities in consultation with key stakeholders, including the appointed State / Territory Environmental Scientific Coordinator	Within 12 hours of monitor and evaluate data being received from ICT	☐
Vermilion Environment Unit Lead with input from OSM Services Provider	Confirm monitoring locations for activated OMPs and SMPs based on: • Current monitor and evaluate data (i.e. situational awareness data, including predicted time to receptor impact, aerial/vessel surveillance observations, tracking buoy data, satellite data); • Nature of hydrocarbon spill (i.e. subsea blow out, surface release, hydrocarbon characteristics, volume, expected duration of release); • Seasonality and presence of receptors impacted or at risk of being impacted; • Current information on transient and broadscale receptors (surface and subsea); • Current operational considerations (e.g. weather, logistics); • Nature of hydrocarbon spill (i.e. subsea blow out, surface release, hydrocarbon characteristics, volume, expected duration of release); • Monitoring priorities identified in Section 2; and • Existing literature, baseline data, and monitoring programs.	Within 12 hours of monitor and evaluate data being received from ICT	☐
	Using the results of the baseline data analysis in Table 4-3 and the information above, determine priority locations for post-spill, pre-impact monitoring	Within 12 hours of monitor and evaluate data being received from ICT	☐
	Confirm the need for any additional reactive baseline monitoring data for SMPs and determine suitable locations, noting that suitable control or reference sites may be outside of the EMBA	Within 12 hours of monitor and evaluate data being received from ICT	☐

Responsibility	Task	Timeframe	Complete
	Continually re-evaluate monitoring priorities in consultation with Environment Unit Lead and relevant key stakeholders throughout spill response	Ongoing	☐

Section 14 Protected Matters requirements

Table 14-1 provides a checklist to ensure monitoring personnel consider protected matters requirements in the finalisation of OMPs and SMPs.

Vermilion's activity-specific EPs outline the management plans, recovery plans and conservation advice statements relevant for the protected matters within the EMBA that are likely to be relevant to the final design of the OMPs and SMPs. The activity-specific EPs and Appendix A also include relevant locations where these receptors are known to occur in order to expedite consideration of relevant information into finalised monitoring designs.

Table 14-1: Checklist for inclusion of protected matters into monitoring designs

Responsibility	Task	Complete
Vermilion Environment Unit Lead with input from OSM Services Provider	Review Monitoring, Evaluation and Surveillance data and available OMP data to determine likely presence and encounter of protected species in predicted trajectory of the spill	☐
	Review the relevant recovery plan/conservation advice/management plan in the activity-specific EP and online protected matters search tool and determine if there have been any updates to the relevant conservation threats/actions. Integrate relevant considerations into the final monitoring design for affected OMPs and SMPs	☐
	Review restrictions on marine mammal buffer distances in SMP: Marine mega-fauna and ensure this is included in all relevant response and monitoring IAPs (e.g. Shoreline Protection Plan, Shoreline Clean-up Plan, OSM Plan), so that response and monitoring field teams maintain required buffer distances from fauna during operations	☐

Section 15 Finalising monitoring design

The methods presented in the Joint Industry OMPs and SMPs are designed to allow the OSM Service Provider and their sub-contracted Monitoring Service Providers the flexibility to modify the standard operating procedures, so that the latest research, technologies, equipment, sampling methods and variables may be used. Monitoring designs may also be varied in-situ, according to the factors presented in Section 10.6 (e.g. weather, logistical restraints) of the Joint Industry OSM Framework.

Vermilion's checklist for finalising monitoring designs post-spill is provided in Table 15-1. The Environment Unit Lead and OSM Implementation Lead provided by a Monitoring Service Provider, will be responsible for approving the finalised monitoring design used in the OMPs and SMPs.

Table 15-1: Checklist for finalising monitoring design

Responsibility	Task	Timeframe	Complete
Vermilion Environment Unit Lead and OSM Implementation Lead with input from OSM Services Provider	Confirm survey objectives, sampling technique, for each initiated OMP and SMP	Within 48 hours of initial monitoring priorities being confirmed by ICT	☐
	Determine suitable sampling frequency	Within 48 hours of initial monitoring priorities being confirmed by ICT	☐
	Finalise standard operating procedures	Within 48 hours of initial monitoring priorities being confirmed by ICT	☐
	Review Table 10-4 of the Joint Industry OSM Framework to ensure potential impacts from response activities are considered and incorporated into relevant OMP/SMP designs	Prior to the finalisation of monitoring designs	☐
	Liaise with the Vermilion Environment Unit Lead to review the Environmental Performance Standards listed in the activity-specific OPEP and integrate checks into the monitoring design that will help determine if relevant Environmental Performance Standards are being met	Prior to the finalisation of monitoring designs	☐
	Scientific monitoring: • Establish benchmarks and guidelines to be used • Confirm indicator species • Confirm parameters and metrics	Within 96 hours of initial monitoring priorities being confirmed by ICT	☐

Section 16 Mobilisation

When the monitoring design has been finalised for each OMP and SMP, the OSM Service Provider shall work in conjunction with Vermilion to develop and execute a monitoring mobilisation plan, which will be incorporated into the Incident Action Planning process.

The OSM Service Provider will be required to coordinate the availability of personnel and equipment for all monitoring programs. Vermilion will be responsible for flights, accommodation, and provisions for field personnel. Vermilion will also be required to procure all vessels, aerial platforms, and vehicles for OMP and SMP implementation.

A checklist for mobilising monitoring teams is provided in Table 16-1.

Table 16-1: Checklist for mobilisation of monitoring teams

Responsibility	Task	Complete
OSM Services Provider with input from Vermilion Environment Unit Lead	Confirm availability of all monitoring personnel (noting required competencies in Section 9.1 and individual OMPs/SMPs)	☐
	Allocate number of teams, personnel, equipment and supporting resource requirements	☐
	Undertake HAZIDs as required and consolidate/review field documentation including safety plans, emergency response plans, and daily field reports	☐
	Develop site-specific health and safety plans which is compliant with health safety and environment systems (including call in timing and procedures)	☐
	Conduct pre-mobilisation meeting with monitoring team/s on survey objectives, logistics, safety issues, reporting requirements and data management collection requirements	☐
	Determine data management delivery needs of the ICT and process requirements, including data transfer approach and frequency/timing	☐
	Confirm data formats and metadata requirements with personnel receiving data	☐
	Logistics	
	Confirm Vermilion Logistics Section have arranged flights, accommodation, and car hire	☐
	Develop field survey schedules, detailing staff rotation	☐
	Equipment	
	Confirm Vermilion Logistics Section have arranged survey platforms (vessel, vehicle, aircraft) as required to survey or access survey sites and ensure they are equipped with appropriate fridge and freezer space for transportation of samples (and carcasses if collecting)	☐
	Confirm Vermilion Logistics Section have arranged vessels with correct fit-out specifications (e.g. winches, Geographic Positioning System [GPS], satellite, deck crane, sufficient deck space, water supplies (fresh and/or salt), accommodation)	☐
	Confirm consumables (including personal protective equipment) have been purchased and will be delivered to required location	☐
	Liaise with NATA-accredited laboratories to confirm availability, limits of detection, sampling holding times, transportation, obtain sample analysis quotes and arrange provision of appropriate sample containers, Chain of Custody (CoC)	☐

Responsibility	Task	Complete
	forms and suitable storage options for all samples. Make arrangements for couriers (if necessary)	
	Confirm specialist equipment requirements and availability (including redundancy)	☐
	Check GPS units and digital cameras are working and that sufficient spare batteries and memory cards are available	☐
	Confirm sufficient equipment to allow integration of survey software and navigational systems (e.g. GPS, additional equipment and adaptors), and additional GPS units prepared	☐
	Confirm GPS survey positions (where available) have been Quality Assurance and Quality Control (QA/QC) checked and pre-loaded into navigation software/positioning system	☐
	Check field laptops, ensuring they have batteries (including spares), power cable, and are functional	☐
	Check if a first aid kit or specialist personal protective equipment (PPE) is required	☐
	Confirm arrangements for freight to mobilisation port is in place	☐

Section 17 Permits and access requirements

Permit and access requirements apply to Marine Parks, Marine Protected Areas, restricted heritage areas, operational areas of industrial sites, defence locations, fauna and managed fisheries, as listed in **Error! Not a valid bookmark self-reference.**. For a list of all relevant locations and fisheries refer to the activity-specific EPs.

The OSM Service Provider will work alongside Vermilion to request access and submit permit applications to all relevant Jurisdictional Authorities in order to conduct monitoring for OMPs and SMPs.

Table 17-1: Permits required in EMBA

Receptor	Jurisdictional Authority	Relevant information on permits
Permits for monitoring fauna	DCCEEW DBCA	Any interactions involving nationally listed threatened fauna may require approval from DCCEEW (http://www.environment.gov.au/biodiversity/threatened/permits) WA- appropriate permits can be found at: https://www.dbca.wa.gov.au/licences-and-permits/fauna
State Marine Protected Area	DBCA	No specific permitting requirements exist for monitoring in WA marine protected areas, but additional information is available at: https://www.dbca.wa.gov.au/management/marine-planning
Ramsar wetland	DCCEEW	Additional information on Ramsar wetlands and how they are protected as a matter of national environmental significance under the EPBC Act is available at: https://www.environment.gov.au/epbc/what-is-protected/wetlands
Australian (Commonwealth) Marine Parks	Director of National Parks Parks Australia	Permit and licence application information for Marine Protected Areas (including monitoring) can be found at: https://onlineservices.environment.gov.au/parks/australian-marine-parks and https://onlineservices.environment.gov.au/parks/australian-marine-parks/permits Additional information on permitting requirements in Australian Marine Parks can be obtained through Parks Australia via email marineparks@environment.gov.au or phone 1800 069 352 Information on permits to access biological resources in Commonwealth areas can be found at: http://www.environment.gov.au/topics/science-and-research/australias-biological-resources/access-biological-resources-commonwealth
State Managed Fisheries	Department of Primary Industries and Regional Development (DPIRD)	No specific permitting requirements exist for WA Fisheries, but additional information is available at – https://www.fish.wa.gov.au/Fishing-and-Aquaculture/Pages/default.aspx

Receptor	Jurisdictional Authority	Relevant information on permits
Commonwealth Managed Fisheries	Australian Fishing Management Authority	Commonwealth Managed Fisheries (scientific permit for research/monitoring in an Australian Fishing Zone) https://www.afma.gov.au/fisheries-services/fishing-rights-permits
Indigenous Cultural Heritage	Department of Planning, Lands and Heritage (DPLH)	Entry access permits to Aboriginal Lands in WA: https://www.wa.gov.au/service/aboriginal-affairs/aboriginal-heritage-conservation/apply-permit-access-or-travel-through-aboriginal-land Aboriginal heritage sites in WA: https://www.wa.gov.au/service/aboriginal-affairs/aboriginal-cultural-heritage/search-aboriginal-sites-or-heritage-places
Defence/restricted military area	Department of Defence	Unexploded Ordnances (mapping information): https://www.defence.gov.au/UXO/default.asp Maritime military firing practice and exercise areas: https://www.hydro.gov.au/n2m/2010/annual/n2m/9.pdf
Industry (e.g. operational zone of offshore oil or gas platform)	Operating company	Safety zones (up to 500 m from outer edge of well or equipment) – https://www.nopsema.gov.au/safety/safety-zones/
Shipwrecks	DCCEEW	Refer to the Underwater Cultural Heritage Act 2018 (Commonwealth): https://www.dcceew.gov.au/parks-heritage/heritage/underwater-heritage/underwater-cultural-heritage-act

Section 18 Use of data in response decision-making

18.1 Operational monitoring to inform response activities

The OSM Implementation Lead, provided by the Monitoring Service Provider, is responsible for the interpretation and analysis of data. OMP data should be analysed rapidly so that it may be used to inform response planning and decisions in the current and/or next operating period. SMP data is designed to be more scientifically robust and long-term in nature and is not relied upon by the ICT for decision-making. Therefore, SMP data will be analysed more thoroughly by the OSM Implementation Lead.

As ultimately responsible for the IAPs, the Vermilion Planning Section Chief will be required to utilise the OMP data to aid in decision making and determine if the response strategies can be commenced, continued, escalated, terminated, or if controls need to be put in place to manage impacts of the response activities. These decisions will be communicated to the broader ICT during regular situation debriefs.

Responsibilities for key personnel and a task checklist is provided in Table 18-1. Data generated from each OMP is provided in Table 18-2.

Table 18-1: Checklist for utilising OMP data to inform ICT decision-making

Responsibility	Task	Timeframe	Complete
OSM Services Provider – Field Team Lead	Data collected whilst implementing OMPs and SMPs is QA/QC checked that it aligns with the requirements listed in the finalised OMPs and SMPs (where applicable)	Ongoing	☐
	Communicate data back the Vermilion ICT via field reporting forms, debriefs and reports	Ongoing	☐
OSM Implementation Lead (Monitoring Service Provider)	Interpret and analyse OM data	Ongoing	☐
	Distribute the data from each monitoring component to the relevant ICT Section	Ongoing	☐
OSM Service Provider	Oversee the collection of data by sub-contracted Monitoring Service Provider field teams, including QA/QC assessment in accordance with the requirements listed in the finalised OMPs and SMPs (where applicable).	Ongoing	☐
	Provide OMP data to the ICT Situation Unit Lead	Daily and ongoing	☐
Vermilion Operations Section (Shoreline Unit)	Reports from OMP: Shoreline Clean-up Assessment will be provided to the ICT daily, detailing the assessed areas to maximise effective utilisation of resources	Daily reporting	☐
Vermilion Planning Chief/Situation Unit Lead	Incorporate OMP data into Common Operating Picture	Daily and ongoing	☐
Vermilion Environment Unit Lead	Incorporate OMP data into operational NEBA and IAP for the next operating period	Each operational period	☐

Table 18-2: Data generated from each OMP and how this may be used by ICT in decision-making

OMP	Data generated[5]	ICT Section requiring data	How data may be used by ICT
OMP1 Hydrocarbon properties and weathering behaviour at sea	Hydrocarbon physical characteristics (e.g. viscosity, asphaltene content, fingerprinting, weathering ratios of hydrocarbon chains)	Planning Section to aid in response option selection / modification	Changes to the hydrocarbon properties will affect the window of opportunity for particular responses and the associated logistical requirements of these responses, such as use of chemical dispersants, recovery and pumping equipment suitability, hydrocarbon storage and hydrocarbon disposal requirements
OMP6 Shoreline clean-up assessment	Assessment of shoreline character; assessment of shoreline oiling; recommendations for response activities; post-treatment surveys	Planning Section to aid in IAP development and response option selection / modification	• Confirmation of shoreline character, habitats and fauna present which may influence selection of response tactics (e.g. no mechanical recovery if turtles are known to be nesting); • Oil deposition and/or removal rate for a shoreline sector will help determine effectiveness of relevant tactics (e.g. shoreline protection and/or clean-up operations); • Assessment teams provide ground truthing of sites that are not possible via satellite imagery, therefore the ICT can rely on the recommendations of Assessment Teams (e.g. flagging access issues, suitable tactics, likely resourcing needs).
OMP4a Surface chemical dispersant effectiveness and fate	Visual observations of dispersant efficacy; Fluorometric readings in water column (see also water quality assessment);	Environment Unit for use in operational NEBA; Planning Section to aid in IAP development; Operations Section to confirm dispersant effectiveness for decision-making purposes in current operations period.	Determine the effectiveness of dispersant in removing oil from sea surface and how dispersed oil is being distributed through the water column. This information can be used in NEBA to help decide if dispersants are being effective at minimising oil reaching sensitive receptors (NEBA to evaluate any trade-offs between receptors)
OMP2 Water quality assessment	Distribution of oil in water column and change in hydrocarbon concentrations (e.g. total recoverable hydrocarbons, BETEXN, PAH), physio-chemical	Situation Unit Lead to validate surveillance and modelling data; Planning Section for use in IAP	Confirm spatial extent of spill within the water column and verify spill modelling and surveillance data; extent of spill can in turn influence location of other OMP and SMP monitoring components and sites. Data can also influence ongoing use of dispersant through ongoing operational NEBA.

[5] Summary only. For additional detail, please refer to individual OMPs. Also note data outputs will be reliant on finalised monitoring design.

OMP	Data generated[5]	ICT Section requiring data	How data may be used by ICT
	parameters and dispersant detection		
OMP3 Sediment quality assessment	Distribution of oil in sediment and change in hydrocarbon concentrations (e.g. Total recoverable hydrocarbons, BETEXN, PAH)	Situation Unit Lead to validate surveillance and modelling data; Planning Section for use in IAP	Confirm spatial extent of spill; extent of spill can in turn influence location of other OMP and SMP monitoring components and sites
OMP5 Marine fauna assessment	Rapid assessment of presence and distribution of marine fauna; evaluate impact of spill and response activities on fauna	Planning Section for use in IAP; Oiled Wildlife Unit/Division to help in developing Wildlife Response Sub-plan	Understanding of species, populations and geographical locations at greatest risk from spill impacts. ICT can use this information to help qualify locations with highest level of protection priority (e.g. dugong nursery area is at risk of high contact therefore dispersant use closest to spill source may be a preferred option); understanding the impacts of spill response activities can help ICT to modify or terminate activities if they are assessed as creating more harm than the oil alone (e.g. large shoreline clean-up teams and staging areas may disturb shorebird nesting resulting in adults abandoning chicks)

18.2 Impacts from response activities

Table 10-4 of the Joint Industry OSM Framework (APPEA, 2021) outlines the potential impacts from response activities and the relevant OMP/SMP for monitoring impacts. For example, if shoreline clean-up was being considered as a response option, then possible impacts resulting from that activity could include physical presence, ground disturbance, water/sediment quality decline and lighting/noise impacts to fauna.

When finalising monitoring designs, the OSM Implementation Lead, provided by the Monitoring Service Provider, shall review Table 10-4 of the Joint Industry OSM Framework and the relevant activity EP to ensure potential impacts from response activities are considered and incorporated into relevant OMP/SMP designs.

18.3 Operational monitoring of effectiveness of control measures and to ensure EPS are met

As stated in Table 15-1, when finalising monitoring designs, the OSM Implementation Lead and Vermilion Environment Unit Lead shall review the Environmental Performance Standards (EPSs) listed in the activity-specific OPEP and integrate checks into the monitoring design that will help determine if relevant EPSs are being met.

Table 18-3 provides relevant EPSs listed in Vermilion's activity-specific OPEPs and how operational monitoring may be able to confirm it is being met.

Table 18-3: Relevant OPEP Environmental Performance Standards related to operational monitoring

Environmental Performance Standard		Confirmation that EPS is being met
EP Risk	**Shoreline protection and deflection**	
EP-OP-R03	Performance criteria, as per WAN-WNAB-CP-ER-02; WAN-WNAB-CP-ER-03, WNAB-CP-ER-01-05 and WNAB-CP-ER-01-06.	Assurance activities as per WAN-WNAB-CP-ER-02; WAN-WNAB-CP-ER-03, WNAB-CP-ER-01-05 and WNAB-CP-ER-01-06.
EP-OP-R04	Performance criteria, as per WAN-WNAB-CP-ER-03-01 - Response strategy - Monitor and evaluate.	Assurance activities as per WAN-WNAB-CP-ER-03.
EP Risk	**Shoreline clean-up**	
EP-OP-R03	Performance criteria, as per WAN-WNAB-CP-ER-02; WAN-WNAB-CP-ER-03, WNAB-CP-ER-01-05 and WNAB-CP-ER-01-06.	Assurance activities as per WAN-WNAB-CP-ER-02; WAN-WNAB-CP-ER-03, WNAB-CP-ER-01-05 and WNAB-CP-ER-01-06.
EP-OP-R04	Performance criteria, as per WAN-WNAB-CP-ER-02; WAN-WNAB-CP-ER-03, WNAB-CP-ER-01-05 and WNAB-CP-ER-01-06.	Assurance activities as per WAN-WNAB-CP-ER-02; WAN-WNAB-CP-ER-03, WNAB-CP-ER-01-05 and WNAB-CP-ER-01-06.
EP-OP-R04	Performance criteria, as per WAN-WNAB-CP-ER-03-06 - Response strategy - Shoreline clean-up.	Assurance activities as per WAN-WNAB-CP-ER-03-06.
EP Risk	**Dispersant application**	
EP-OP-R03	Performance criteria, as per WAN-WNAB-CP-ER-02; WAN-WNAB-CP-ER-03, WNAB-CP-ER-01-05 and WNAB-CP-ER-01-06.	Assurance activities as per WAN-WNAB-CP-ER-02; WAN-WNAB-CP-ER-03, WNAB-CP-ER-01-05 and WNAB-CP-ER-01-06.

Environmental Performance Standard		Confirmation that EPS is being met
EP-OP-R04	Performance criteria, as per WAN-WNAB-CP-ER-03-02 - Response Strategy - Chemical dispersant application.	Assurance activities as per WAN-WNAB-CP-ER-03-02.
EP-OP-R04	Performance criteria, as per WAN-WNAB-CP-ER-03-03 - Response strategy - Mechanical dispersant application.	Assurance activities as per WAN-WNAB-CP-ER-03-03.

Section 19 Data management

Minimum standards for data management are provided in Section 10.11 of the Joint Industry OSM Framework (APPEA, 2021) and will be adopted by Vermilion and the OSM Service Provider.

Section 20 Quality assurance and quality control

Refer to Section 10.11 of the Joint Industry OSM Framework (APPEA, 2021) for QA/QC minimum standards which will be adopted by Vermilion and the OSM Service Provider.

Section 21 Communication protocols

21.1 OSM Service Provider

Communication protocols between Vermilion and its OSM Service Provider with respect to delivery of the OMPs and SMPs (during both preparedness and implementation) are intentionally defined to ensure clear and consistent information is provided in both directions.

The following communication protocols must be observed:

- Communication between Vermilion and its OSM Service Provider during the preparedness phase (pre-spill) will be between the nominated Industry Member Technical Advisory Group representative and the OSM Service Provider.
- Communication between Vermilion and its OSM Service Provider during activation will be between the Environment Unit Lead and the OSM Service Provider representative.
- During implementation (post deployment), primary communication occurs via two pathways:
  - Environment Unit Lead and the OSM Service Provider Duty Manager for contractual, management, scientific and general direction matters; and
  - Vermilion Division Commander / On-Scene Commander and the OSM Field Team Leaders for on-site matters.
- All key OSM decisions should be logged in an ICS 214 Log Form maintained by the OSM Implementation Lead. All key OSM tasks, actions and requirements should be documented in an IAP during the response phase of the spill.
- The Vermilion Environment Unit Lead will keep the Operations Section Chief, Logistics Section Chief and Planning Section Chief briefed of the OSM status as required.
- All correspondence (copies of emails and records of phone calls) between Vermilion and the OSM Services Provider during a response should be recorded and kept on file.
- All communication received by OSM Service Provider not in line with these protocols should be reported to the Environment Unit Lead who will seek guidance on the accuracy of the information received.
- Unless related to safety (e.g. evacuation), any direction or instruction received by the OSM Service Provider outside of these protocols should be confirmed via the Vermilion Environment Unit Lead or On-Scene Commander prior to implementation.

During the post-response phase all communications shall be between the Vermilion Environment Advisor and the OSM Service Provider.

21.2 External stakeholders

Results of OMPs and SMPs will be discussed with relevant stakeholders through Vermilions ICT Public Information Officer. Information will be shared with regulatory agencies/authorities as required and inputs received from stakeholders will be evaluated and where practicable, will be used to refine the ongoing spill response and/or ongoing operational and/or scientific monitoring.

Stakeholder communications post-response will be managed by the Vermilion Stakeholder Liaison team.

Section 22 Stand down process

Monitoring for each component will continue until termination criteria for individual components are reached. Typically, OMPs will terminate when agreement has been reached with the Jurisdictional Authorities relevant to the spill to terminate the response or a relevant SMP has been activated. SMPs will continue after the spill response has been terminated and until such time as their termination criteria are also reached. A list of criteria is provided in the OSM Framework.

After OMPs are terminated, the OMP monitoring teams will be advised to stand down. Following this stage, Vermilion is responsible for coordinating a lessons-learnt meeting between the OSM Service Provider, sub-contracted Monitoring Service Providers and other relevant stakeholders.

It is the responsibility of Vermilion to ensure that lessons learnt are communicated to the relevant stakeholder groups. The lessons discussed should include both positive actions to be reinforced and lessons for actions that could be improved in future standby or response campaigns. Table 22-1 provides a checklist to assist in terminating the OMPs and SMPs and the monitoring effort.

Table 22-1: Checklist for terminating monitoring components

Responsibility	Task	Complete
Vermilion Environment Unit Lead / Environment Advisor with input from OSM Services Provider	Review termination criteria of OMPs and SMPs (provided in Table 9-1 (OMPs) and Table 9-2 (SMPs) of the Joint Industry Operational and Scientific Monitoring Framework) to ensure OMPs and SMPs are terminated in accordance with these criteria	☐
	Ensure all SMP monitoring reports are peer reviewed by an expert panel (refer to Section 10.10 of the Joint Industry OSM Framework)	☐
	Conduct lessons-learnt meeting	☐

Section 23 References

APPEA (2021) Joint Industry Operational and Scientific Monitoring Plan Framework. Rev D. Report prepared by BlueSands Environmental for APPEA Marine and Environmental Science Working Group.

Kirby MF, Brant J, Moore J, Lincoln S (eds) (2018) PREMIAM – Pollution Response in Emergencies – Marine Impact Assessment and Monitoring: Post-incident monitoring guidelines. Second Edition. Science Series Technical Report. Cefas, Lowestoft.

APPEA (2021a) Operational and Scientific Monitoring Bridging Implementation Plan Template. Rev A.

NOPSEMA (2021) Regulatory Advice Statement on APPEA's Joint Industry Operational and Scientific Monitoring Framework.

NOPSEMA (2024) Operational and Scientific Monitoring Programs N-04750-IP1349 A343826.

Appendices

Appendix A : Background information for key sensitivities

Table C-1: Background information for key sensitivities predicted to be contacted within 7 days, at a probability >5%, and requiring a baseline review

Location	Receptor	Background	Key locations	Seasonality
Barrow Island	Birds	Important feeding and resting area for migratory shorebirds. Under the Ramsar Convention, an area is recognised as an internationally significant littoral avifauna site if it supports >1% of a species' population. Barrow Island meets this Ramsar criterion for six trans-equatorial migratory species: grey-tailed tattler (*Tringa brevipes*), ruddy turnstone (*Arenaria interpres*), red-necked stint (*Caladrius ruficollis*), sanderling (*Calidris alba*), greater sand plover (*Charadrius leschenaultia*) and lesser sand plover (*Charadrius mongolus*). It is also significant for two non-migratory birds: fairy tern (*Sterna nereis*) and the northern race of the sooty oystercatcher (*Haematopus fuliginosus opthalmicus*) (DEC 2006). Nesting area for seabirds.	The highest abundances of shorebirds are associated with the extensive tidal mudflats of the south-eastern and southern coasts, such as Bandicoot Bay.	Migratory shorebird abundances increase on the island as the birds arrive from the north during September to December. The abundances of some migratory shorebirds continue to increase in January and February, suggesting local movements of birds from the mainland to Barrow Island. Abundances decrease as the migratory species leave the region to return north at the end of summer.
	Turtles	Green (*Chelonia mydas*), flatback (*Natator depressus*), hawksbill (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*) turtles (DEC 2006).	Flatbacks nest on sandy beaches on the mid-eastern coast (DEC 2006). Green turtles predominantly use exposed sandy beaches on the west coast (DEC 2006). Substantial mating populations of green turtles are found in the waters of north-western Barrow Island (DEC 2006). Green turtle can be found year-round feeding on algae-covered rocky intertidal and subtidal platforms off the west coast (DEC 2006).	Flatback: breeding/nesting season October – January. Hatching season: February – March. Green turtle: mating aggregations may commence from October with peak nesting from December to January, however, nesting does occur year-round (Moro and MacAulay 2010). Hawksbill: The peak season for nesting is between October and November, with less frequent nesting

Location	Receptor	Background	Key locations	Seasonality
			Feeding grounds for hawksbill turtles have been identified to the south of the Barrow Shoals (DEC 2006).	during December and January round (Moro and MacAulay 2010).
	Cetaceans	Whale species that may occasionally visit include the humpback whale (*Megaptera novaeangliae*), short-finned pilot whale (*Globicephala macrorhynchus*), false killer whale (*Pseudorca crassidens*), killer whale (*Orcinus orca*), minke whale (*Balaenoptera acutorostrata*), Bryde's whale (*Balaenoptera edeni*), sei whale (*Balaenoptera borealis*), pygmy blue whale (*Balaenoptera musculus brevicauda*), fin whale (*Balaenoptera physalus*), melon-headed whale (*Peponocephala electra*), sperm whale (*Physeter macrocephalus*) and the blue whale (*Balaenoptera musculus musculus*). Of these, only the humpback whale is a regular visitor to the area (DEC 2006). Bottlenose dolphins (*Tursiops truncatus*) and humpback dolphins (*Sousa sahulensis*) have resident populations within the shallow waters of the inner Rowley Shelf, including the Barrow Island area (DEC 2006). Spinner dolphins (*Stenella longirostris*), common dolphins (*Delphinius delphis*), and striped dolphins (*Stenella caeruleoalba*) are abundant in the waters around Barrow Island (DEC 2006).	Spinner dolphins, common dolphins, and striped dolphins are generally oceanic species and are likely to be most abundant on the west coast of the island (DEC 2006).	-
	Dugong	Dugong (*Dugong dugon*) significant sightings (Bancroft et al. 2000)	-	-
	Mangroves	Restricted areas of stunted *Avicennia marina* occurring in narrow fringing strips in embayments (DEC 2006).	Mattress Point, south of the Chevron camp, near the airstrip, at Stokes Point and near Pelican Island on the western side of Bandicoot Bay (DEC 2006).	-
Bedout Island	Turtle	Flatback nesting (Fossette et al. 2021)	-	-
	Birds	Listed as an Important Bird and Biodiversity Area (Birdlife International 2019).		

Location	Receptor	Background	Key locations	Seasonality
		Seabird breading including Lesser Frigatebird (*Fregata ariel*), Masked Booby (*Sula dactylatra*) and Brown Boobies (*Sula leucogaster*) (Lavers et al. 2020).		
Broome – Roebuck, Broome North Coast	Cetaceans	Roebuck Bay has the largest known Australian snubfin dolphin (*Orcaella heinsohni*) population in the world, with over 150 individuals recorded (DBCA 2024). Indo-Pacific Humpback Dolphin (*Sousa chinensis*) – nearshore species, regularly observed in Roebuck Bay (DPIRD, date unknown). Indo-Pacific Bottlenose Dolphin (*Tursiops aduncus*) – nearshore species observed in mangrove and seagrass bed habitat in Roebuck Bay (DPIRD, date unknown). Humpback Whales (*Megaptera novaeangilae*) – dry season migratory route in Roebuck Bay to calving grounds along Kimberly Coast (DPIRD, date unknown).	Roebuck Bay	Humpback migration occurring in dry season from April to October.
	Turtles	Green Turtle (*Chelonia mydas*) – most commonly observed turtle species in Roebuck bay. Found in seagrass bed and reef habitat. Utilises Roebuck Bay as seasonal feeding area and transit area on migration (Roebuck Bay Working Group Inc. 2017a) (Roebuck Bay Working Group Inc. 2017b). Flatback Turtle (*Natator depressus*) nests in small numbers around Cape Villaret during summer months (Roebuck Bay Working Group Inc. 2017a) (Roebuck Bay Working Group Inc. 2017b). Hawksbill Turtle (*Eretmochelys imbricata*) observed in limited numbers within Roebuck Bay. No major nesting sites within Roebuck Bay, but are known to nest along the Broome North Coast, particularly the Cape Leveque area. (Roebuck Bay Working Group Inc. 2017a). Loggerhead Turtle (*Caretta caretta*) commonly observed within Roebuck Bay, although population numbers are not well documented. No major nesting sites within Roebuck Bay, but are known to nest along the Broome North Coast, particularly the Cape Leveque area. Utilises Roebuck Bay as seasonal feeding area and transit area on migration (Roebuck	Roebuck Bay Broome North Coast Cape Villaret Cape Leveque	Flatback turtle nesting around Cape Villaret in Summer months.

Location	Receptor	Background	Key locations	Seasonality
		Bay Working Group Inc. 2017a) (Roebuck Bay Working Group Inc. 2017b). Olive Ridley Turtle (*Lepidochelys olivacea*) observed in limited numbers within Roebuck Bay (Roebuck Bay Working Group Inc. 2017a). Closest major nesting point further along Kimberly Coast.		
	Dugong	Dugong (*Dugong dugon*) – Roebuck Marine Park, located 12 km offshore from Broome, is active with dugongs and considered a key area for the species. Broome North Coast provides critical foraging area through seagrass bed habitat. Roebuck houses one of the largest dugong populations in Western Australia, with over 1,000 estimated individuals in the bay and adjacent coastal waters (Seamap Australia, date unknown). Roebuck population is considered to be of national significance (Australian Marine Parks, date unknown).	Roebuck Bay and Roebuck Marine Park	-
	Birds	The extensive tidal flats and beaches of Eighty Mile Beach and Roebuck Bay), are of great importance to migratory shorebirds. No other region in Australia supports such large and diverse nonbreeding populations (Bamford et al. 2008, Hansen et al. 2016). Between them Eighty Mile Beach and Roebuck Bay support 21 shorebird species in internationally significant numbers (i.e. >1% of the entire population of the East Asian Australasian Flyway), that almost 3.5 million shorebirds in total occur on these sites, and they include ~580,000 shorebirds that forage on tidal flats (Rogers et al. 2011).	At Roebuck Bay, different roosts are used on daytime and night-time high tides (Roger et al. 2020). Shorebirds roost at the closest acceptable roost to their preferred foraging grounds; in species in which the location of preferred feeding areas is not static over time, roost location also varies over time (Roger et al. 2020). Wet season rains and spring create temporary supratidal wetlands which are very difficult for humans to access; many coastal shorebirds roost in these sites when they are available and are therefore overlooked when shorebird surveys are restricted to easily accessed beach roosts (Roger et al. 2020).	Migratory shorebirds arrive at Roebuck Bay from late August onwards. Mid-March to mid-May is the peak departure period.

Location	Receptor	Background	Key locations	Seasonality
Dampier Region (Northern Pilbara to Karratha) and Dampier Archipelago)	Cetaceans	Humpback whales (*Megaptera novaeangliae*): Biologically Important Area Migration for humpback whales. Females occasionally give birth in the waters of the Dampier Archipelago, although the main calving area is further north (CALM 2005)	Adult humpback whales and their young frequent the Archipelago on their southern migrations in early spring, and the Mermaid Sound (area of water between the western coastline of the Burrup Peninsula to the east of the Dampier Port, and Dampier Archipelago to the west) is a significant resting area for females with calves (MMPATF 2021; CALM 2005; CALM 1990).	Humpback whale northern migration past Pilbara occurs June and July while southern migration occurs in early spring.
		Humpback dolphins (*Sousa sahulensis*): The Australian humpback dolphin exhibit relatively small home ranges (<300 km^2) and high site fidelity (Hanf et al. 2016).	Humpback dolphins inhabit shallow, coastal waters; typically, within 20 km of land and in water depths of less than 20 m (Parra and Jedensjö 2013; Hanf et al. 2015; Hanf et al. 2021; Hunt et al. 2017). In the Pilbara, they have been recorded up to 50 km from the mainland, but possibly associated with offshore islands (Hanf et al. 2015; Hanf et al. 2021).	Humpback dolphins may be present throughout the year.
		Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) have been recorded throughout nearshore waters of the region (Hanf et al 2016; Allen et al. 2012; Hanf et al. 2021).	-	Indo-Pacific bottlenose dolphins may be present throughout the year.
	Dugong	Current knowledge on the size of the population of the Dampier Archipelago/ Cape Preston area for dugongs (*Dugong dugon*) is limited (MMPATF 2021).	Small numbers of dugongs have been sighted in shallow, warm waters in bays and between islands, including at East Lewis Island, Cape Preston, Regnard Bay, Nickol Bay and west of Keast Island (MMPATF 2021; CALM 2005). Dugongs have a strong association with seagrass habitat. Seagrass beds are found throughout Nickol Bay and around many of the islands (Worley Parsons 2009).	May be present throughout the year.

Location	Receptor	Background	Key locations	Seasonality
	Birds	Many of the islands are important seabird nesting sites. The Dampier Archipelago has been recognised to have BIAs based on breeding for the wedge-tailed shearwater (*Ardenna pacifica*), roseate tern (*Sterna dougallii*) and Australian fairy tern (*Sternula nereis*). Important feeding and resting area for migratory shorebirds, utilising many beaches and mud flats (CALM 1990).	Angel Island: shorebird sightings: Bar-tailed godwit (*Limosa lapponica*), Ruddy turnstone (*Arenaria interpres*), Whimbrel (*Numenius phaeopus*). Brigadier Island: Shorebird sightings: Whimbrel (*Numenius phaeopus*). Cohen Island: Shorebird sightings: Ruddy turnstone (*Arenaria interpres*), Grey-tailed tattler (*Tringa brevipes*). Seabird nesting: Wedge-tailed shearwater (*Ardenna pacifica*), Caspian tern .(*Hydroprogne caspia*) Collier Rocks: Seabird nesting: Wedge-tailed shearwater (*Ardenna pacifica*). Conzinc Island: shorebird sightings: Grey-tailed tattler (*Tringa brevipes*) Seabird nesting: Wedge-tailed shearwater (*Ardenna pacifica*), Caspian tern (*Hydroprogne caspia*) Delambre Island: Seabird nesting: Wedge-tailed shearwater (*Ardenna pacifica*) Dolphin Island: shorebird sightings: Red-necked stint (*Calidris ruficollis*), Grey plover (*Pluvialis squatarola*), Grey-tailed tattler (*Tringa brevipes*) Elphick Nob: Seabird nesting: Australian fairy tern (*Sternula nereis*), Wedge-tailed shearwater (*Ardenna pacifica*). Egret Island: Seabird nesting: Caspian tern (*Hydroprogne caspia*) Enderby Island: shorebird sightings: Sharp-tailed sandpiper (*Calidris*	Australian fairy tern breeding: August-November (CALM 1990) Wedge-tailed shearwater breeding: October – April (CALM 1990; Nicholson 2002) Caspian tern .(breeding: July – October (CALM 1990) Roseate tern breeding: August – December (Higgins and Davies 1996

Location	Receptor	Background	Key locations	Seasonality
			acuminata), Oriental plover (*Charadrius veredus*), Whimbrel (*Numenius phaeopus*), Grey-tailed tattler (*Tringa brevipes*). Seabird nesting: Caspian tern. (*Hydroprogne caspia*) Gidley Island: Shorebird sightings: Whimbrel (*Numenius phaeopus*). Goodwyn Island: Shorebird sightings: Grey-tailed tattler (*Tringa brevipes*) Seabird nesting: Australian fairy tern (*Sternula nereis*), Wedge-tailed shearwater (*Ardenna pacifica*), Roseate tern (*Sterna dougallii*). Hauy Island: Seabird nesting: Wedge-tailed shearwater (*Ardenna pacifica*) Keast Island: Seabird nesting: Caspian tern .(*Hydroprogne caspia*), Australian Peican (*Pelecanus conspicillatus*) Kendrew Island: Seabird nesting: Australian fairy tern (*Sternula nereis*), Wedge-tailed shearwater (*Ardenna pacifica*) Lady Nora Island: Shorebird sightings: Oriental plover (*Charadrius veredus*), Whimbrel (*Numenius phaeopus*) Seabird nesting: Wedge-tailed shearwater (*Ardenna pacifica*), Caspian tern (*Hydroprogne caspia*) Legendre Island: Whimbrel (*Numenius phaeopus*), Grey-tailed tattler (*Tringa brevipes*) Seabird nesting: Wedge-tailed shearwater (*Ardenna pacifica*)	

Location	Receptor	Background	Key locations	Seasonality
			Malus Island: Shorebird sightings: Grey-tailed tattler (*Tringa brevipes*) Seabird nesting: Wedge-tailed shearwater (*Ardenna pacifica*) Nelson Rocks: Shorebird sightings: Whimbrel (*Numenius phaeopus*) Roly Rocks: Seabird nesting: Wedge-tailed shearwater (*Ardenna pacifica*) Rosemary Island: Shorebird sightings: Red-necked stint (*Calidris ruficollis*) Seabird nesting: Caspian tern (*Hydroprogne caspia*) (CALM 2005; Higgins and Davies 1996)	
	Turtles	The waters of the Dampier Archipelago are used for breeding while the sandy beaches are regularly used for nesting by green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*) and flatback turtles (*Natator depressus*), and occasionally by loggerhead turtles (*Caretta caretta*) (CALM 2005). Leather back turtles have been recorded in waters of the Dampier Archipelago, however, do not nest in this area.	Flatback turtle: There are significant rookeries centred on Dampier Archipelago (DoEE 2017; Limpus 2007). Delambre Island, Enderby Island, Hauy Island, Keast Island and Legendre Island have records of moderate nesting (Pendoley 2019). Delmbre Island has been recognised as the largest flatback turtle rookery in Australia with an estimated 3500 nesting females per year (Pendoley 2019). Green turtle: some the nesting sites have been identified as principal near-coastal rookeries for the species (DoEE 2017; Waayers et al. 2014). Angel Island, Cohen Island, Delambre Island, Dolphin Island, Eaglehawk Island, Enderby Island, Goodwyn Island, Hauy Island, Keast Island, Lady Nora Island, Legendre Island, Malus	The flatback turtle nesting during the summer months (October to March) with peak nesting in November to January (DoEE 2017; CALM 2005; CALM 1990). The green turtle nesting during the summer months (November – March) with peak nesting between December to February (DoEE 2017; CALM 2005; CALM 1990). The hawksbill turtle nesting during the summer months (October – February) with peak nesting in October to January, however, are known to nest all year round in the region (DoEE 2017; DSEWPC 2012b; CALM 2005; Prince 1993; CALM 1990).

Location	Receptor	Background	Key locations	Seasonality
			Island, Rosemary Island, and West Lewis Island have records nesting for this species (Pendoley 2019). Hawksbill nesting in WA is centred on the Pilbara (Dampier Archipelago) (Whiting et al. 2018; Waayers et al. 2014; Limpus 2002). Rosemary Island is considered a significant breeding area, supporting the most significant hawksbill turtle rookery in the Western Australian region and one of the largest in the Indian Ocean; tens to hundreds of animals nest on the island annually, more than any other Western Australian rookery, with approximately 1000 nesting females nesting per year (Pendoley Environmental 2019; DoEE 2017; DSWEPC 2012d). Angel Island, Delambre Island, Dolphin Island, Eaglehawk Island, Enderby Island, Goodwyn Island, Malus Island and Rosemary Island have records of moderate nesting (Pendoley 2019).	
	Coral	Live coral cover can vary greatly from reef to reef, as indicated by contrasting covers of 10–60% on Sailfish Reef and Hamersley Shoal, respectively (CALM 2005).	High coral diversity is found on the seaward slopes of Delambre Island, Hamersley Shoal, Sailfish Reef, Kendrew Island and north-west Enderby Island (CALM 2005).	-
	Mangroves	Six species of mangrove are found within the Dampier Archipelago/Cape Preston region: the white mangrove (*Avicennia marina*), red mangrove (Rhizophora stylosa), club mangrove (*Aegialitis annulata*), ribbed-fruit orange mangrove (*Brugiera exaristrata*), yellow- leaf spurred mangrove (*Ceriops tagal*) and river mangrove (*Aegiceras cornculatum*) (CALM 2005).	Most mangals occur along the mainland coast on the tidal flats at Regnard Bay, the Maitland River mouth, King Bay and Nickol Bay. Well-developed communities also occur in some of the sheltered bays on the islands, for example at West	-

Location	Receptor	Background	Key locations	Seasonality
			Intercourse Island, in Searipple Passage and the southern shores of West Lewis and East Lewis islands (CALM 2005). The mangrove communities at the Fortescue River delta, Cape Preston area, West Intercourse Island, Enderby Island, Searipple Passage/Conzinc Bay and Dixon Island have been assessed by Semeniuk (1997) as having international significance from a biodiversity and ecological basis (CALM 2005).	
	Seagrass	Seagrasses occur sparsely, in low diversity and low abundance, on shallow, unconsolidated sediments of sand and muddy sand (Jones 2004).	The most significant areas of seagrass are found between Keast and Legendre islands and between West Intercourse Island and Cape Preston (CALM 2005).	-
Eighty mile beach	Mangroves	The Eighty Mile Beach is almost devoid of mangroves. The exceptions are two small tidal creeks on Mandora Station (Johnstone et al. 2013).	Two small tidal creeks on Mandora Station (Johnstone et al. 2013).	-
	Birds	The extensive tidal flats and beaches of Eighty Mile Beach and Roebuck Bay), are of great importance to migratory shorebirds. No other region in Australia, or indeed anywhere else in the East Asian Flyway, supports such large and diverse nonbreeding populations (Bamford et al. 2008, Hansen et al. 2016). Between them Eighty Mile Beach and Roebuck Bay support 21 shorebird species in internationally significant numbers (i.e. >1% of the entire population of the East Asian Australasian Flyway), that almost 3.5 million shorebirds in total occur on these sites, and they include ~580,000 shorebirds that forage on tidal flats (Rogers et al. 2011).	Shorebird roosting distribution in north-western Australia is limited by their intolerance of hot microclimates; by day most species need to roost on wet substrates to avoid heat stress (Roger et al. 2020). Shorebirds prefer open roost settings and avoid sites where the tide pushes them close to tall features (e.g. mangroves, sand dunes) that can be used as cover by hunting birds of prey (Roger et al. 2020). At Eighty Mile Beach density of shorebirds on tidal flats at low tide is	Around September the first migratory shorebirds arrive and by October many disperse further across Australia, using Eighty Mile Beach as an important staging area (Commonwealth of Australia 2016).

Location	Receptor	Background	Key locations	Seasonality
			strongly correlated with high tide counts on the adjacent beaches, suggesting shorebirds there typically roost on beaches close to their preferred foraging sites (Roger et al. 2020).	
Exmouth Gulf	Salt flats-extensive and significant	-	Flats extend ~1,026 km^2 from Locker Point to Sandalwood Peninsula, and range from the 4.5–13 km wide (Brunskill et al. 2001; D.C. Blandford and Associates Pty Ltd and Oceanica Consulting Pty Ltd 2005).	-
	Blue-green algal. Mats	-	Extensive blue-green algal mats (cyanobacterial mats) occupy the high intertidal zone along the eastern (~85 km^2) and southern margins (~20 km^2) of Exmouth Gulf (Sutton and Shaw 2021).	-
	Salt marshes	-	Saltmarshes (namely samphire) occur extensively along the eastern intertidal margin of Exmouth Gulf, and also along the southern and western margins (Fitzpatrick et al. 2019). They also often line tidal creeks along with mangroves (Oceanica 2006).	-
	Mangroves	-	Mangroves are extensive from Bay of Rest and Gales Bay to all along the eastern margin of Exmouth Gulf (Humphreys et al. 2005; Lyne et al. 2006; Oceanica 2006; EPA 2008; Fitzpatrick et al. 2019).	-
	Reef flats and oyster beds	-	Low relief subtidal reef is extensive around Bundegi and North West Cape across to Muiron Islands (Bancroft	-

Location	Receptor	Background	Key locations	Seasonality
			and Sheridan 2000; Beckley and Lombard 2012; van Keulen and Langdon 2011). It is likely that subtidal reef flats are found around many of the islands, such as Eva and Fly Islands, which have shallow reef flats off the northern edges (Dee et al. 2020). Oyster beds are present on intertidal pavements around Heron Point (Fitzpatrick et al. 2019).	
	Macroalgae and turf algae	-	Macroalgae beds are a common vegetated habitat across Exmouth Gulf, occurring along the central, eastern, southern, and western margins, as well as around many of the islands to the north of Exmouth Gulf (Cassata and Collins 2004; Lyne et al. 2006; Cassata and Collins 2008; van Keulen and Langdon 2011; McLean et al. 2016; BMT 2020).	-
	Seagrass	-	Seagrass meadows have been known to occur along the eastern, southern and western margins of Exmouth Gulf, and around islands such as Muiron Islands, Burnside Island and Tent Island (Hutchins et al. 1996; RPS Bowman Bishaw Gorham 2004; Lyne et al. 2006; Oceanica 2006; Vanderklift et al. 2016). Coverage estimates for seagrasses are variable across Exmouth Gulf, noting that the extent and abundance of seagrass meadows across the whole Gulf has not been comprehensively mapped (Sutton and Shaw 2021).	-

Location	Receptor	Background	Key locations	Seasonality
	Corals	-	Soft and hard coral communities are spread around the coastal margins of Exmouth Gulf, as well as around islands inside and outside Exmouth Gulf (Lyne et al. 2006; Babcock et al. 2008b; Twiggs and Collins 2010; 360 Environmental 2017). Mainly distributed along the southern and eastern margins of Exmouth Gulf (Irvine and Salgado Kent 2019).	-
	Turtles	-	Mainly distributed along the southern and eastern margins of Exmouth Gulf (Irvine and Salgado Kent 2019).	Observed within the gulf year-round
	Marine mammals	Exmouth Gulf is included in the Ningaloo Reef to Montebello Islands Important Marine Mammal Area, assigned by the IUCN Marine Mammal Protected Areas Task Force (IUCN-MMPATF 2021). The qualifying species include the dugong (*Dugong dugon*), Australian humpback dolphin (*Sousa sahulensis*) and humpback whale (*Megaptera novaeangliae*). Humpback whale (*Megaptera novaeangliae*) resting and nursing area		Humpback whale: June through to the end of October
	Dugong	Strong evidence of population connectivity between Shark Bay and Exmouth Gulf (Gales et al. 2004).	Mainly observed in shallow waters (<100 m) in Exmouth Gulf and around the North West Cape (Jenner and Jenner 2005, Sleeman et al. 2007; RPS 2010)	Dugongs were reported to be more frequent in Exmouth Gulf in August (RPS 2010).
	Birds	Identified as an internationally important shorebird area (Weller et al. 2020).	Exmouth Gulf Mangroves is an Important Bird Area (IBA) and a Key Biodiversity Area (Dutson et al. 2009; Key Biodiversity Areas Partnership 2020). It extends 70 km from Giralia Bay to Turbridgi Point. The three bird species triggering the KBA criteria include the dusky gerygone (Gerygone tenebrosa), pied	Juvenile shorebirds can be found year-round. Adults usually between August and April.

Location	Receptor	Background	Key locations	Seasonality
			oystercatcher (Haematopus longirostris) and grey-tailed tattler (Tringa brevipes) (Key Biodiversity Areas Partnership 2020). The entire Exmouth Gulf coastline, islands (in particular Sunday Island and Muiron Islands), and the coastline from North West Cape to Point Billie are identified as an internationally important shorebird area (Weller et al. 2020). Exmouth Gulf and islands meet the 'species criteria' for International Significance (supporting >1% of the flyway population) for grey-tailed tattler, eastern curlew (*Numenius madagascariensis*) and ruddy turnstone (*Arenaria interpres*) (Onton et al. 2013; Weller et al. 2020).	
Karratha to Port Hedland	Birds		The Port Hedland Saltworks is a regular nonbreeding destination for both northern hemisphere and a limited range of local Australian shorebirds (Johnstone et al. 2013).	Migrating shorebirds arrive in northern Australia between late August and early November.
	Turtle	Flatback turtles (*Natator depressus*) found at Cemetery Beach and Mundabullangana are a part of the same genetic management unit as flatbacks found at Thevenard Island and Barrow Island (Whittock et al. 2014)	Flatback (*Natator depressus*) rookeries at Mundabullangana and Cemetery beach (Whittock et al. 2014)	Flatback turtle nesting season for this area is from November to January and hatchling season is from December to March. Migratory shorebird numbers on northern Australian beaches peak in November and again in March as the majority of birds begin their return to the northern hemisphere (Bennelongia Pty Ltd 2011).

Location	Receptor	Background	Key locations	Seasonality
	Cetaceans	This area is within the know distribution of humpback dolphins (*Sousa chinensis*) (Parra et al. 2017) and Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) (Braulik et al 2019).	-	-
Lowendal Islands	Birds	Nesting area for seabirds.	Abutilon, Beacon, Bridled, Parakeelya, and Varanus islands	Seabird nesting all year, peak Oct – Jan. Pied cormorant (*Phalacrocorax varius*) nests in winter (Nicholson 2002). Wedge-tailed shearwater (*Ardenna pacifica*) and Bridled tern (*Onychoprion anaethetus*) nest in Summer (Nicholson 2002). Silver gull (*Larus novaehollandiae*) nests in summer and Autumn (Nicholson 2002). Crested tern (*Thalasseus bergii*), Lesser crested tern (*Thalasseus bengalensis*) and Roseate tern (*Sterna dougallii*) nest in Autumn (Nicholson 2002).
	Turtles	Green (*Chelonia mydas*), flatback (*Natator depressus*), hawksbill (*Eretmochelys imbricata*), loggerhead (*Caretta caretta*) and leatherback (*Dermochelys coriacea*) turtles (DEC 2006).	All beaches on Beacon, Bridled, Varanus, Abutilon, Parakeelya Islands Significant hawksbill nesting on Varanus Island (DSEWPC 2012a). Hawksbill foraging around the Lowendal Island group (DSEWPC 2012a).	Hawksbill nesting in spring and early summer (peak October) with a 20 km internesting buffer. Flatback nesting peak late December – early January with a 20 km internesting buffer (DSEWPC 2012a).
	Cetaceans	Whale species that may occasionally visit include the humpback whale (*Megaptera novaeangliae*), short-finned pilot whale (*Globicephala macrorhynchus*), false killer whale (*Pseudorca crassidens*), killer whale (*Orcinus orca*), minke whale (*Balaenoptera acutorostrata*), Bryde's whale (Balaenoptera edeni), sei whale (*Balaenoptera borealis*), pygmy blue whale (*Balaenoptera musculus brevicauda*), fin whale (*Balaenoptera physalus*), melon-headed whale	-	-

Location	Receptor	Background	Key locations	Seasonality
		(*Peponocephala electra*), sperm whale (*Physeter macrocephalus*) and the blue whale (*Balaenoptera musculus musculus*). Of these, only the humpback whale is a regular visitor to the area (DEC 2006).		
	Dugong	The seagrass beds around the Lowendal Islands are thought to provide a valuable food source for dugong (*Dugong dugon*) (DEC 2006).	-	-
	Mangroves	Mangroves occupy less than 0.1% of the coastline (DEC 2006).	-	-
Montebello Islands	Birds	Twenty-six species of seabirds and waders, including migratory waders, are known in the Montebello Islands Marine Area. Migratory and threatened seabirds – Significant nesting, foraging and resting areas (Burbidge et al. 2000). At least 61 islands in the Montebello group are used by nesting seabirds (DEC 2006). Waterbirds- Historically moderately common: pied cormorant (*Phalacrocarax varius*), Australian pelican (*Pelecanus conspicillatus*), Historically common: eastern reef egret (*Egretta sacra*), osprey (*Pandion haliaetus*) Shorebirds- Historically moderately common: whimbrel (*Numenius phaeopus*), greenshank (*Tringa nebularia*), common sandpiper (*Actitis hypoleucos*), ruddy turnstone (*Arenaria interpres*), red-necked stint (*Calidris ruficollis*) Historically common: bar-tailed godwit (*Limosa lappanica*), grey-tailed tattler (*Heteroscelus brevipes*), beach stone-curlew (*Esacus neglectus*), pied oystercatcher (*Haematopus ostralegus*), sooty oystercatcher (*Haematos fuliginosus*) Burbidge et al. 2000).	Wedge-tailed shearwater (*Puffinus pacificus*) significant breeding historically reported on Ah Chong, Gossypium, Brooke, Flag, Gardenia and South East Islands. Silver gull (*Larus novaehollandiae*) breeding historically reported on Brooke and South East. Caspian tern (*Sterna caspia*) common breeding resident historically on Ah Chong, Alpha, Bluebell, Dandelion, Flag, Foxglove, Islet to south of Hermite, Ivy, Kunzea, Marri Islands, Primrose, Renewal and Trimouille. Roseate tern (*Sterna dougallii*) significant historical breeding historically reported on Dahlia, Dandelion, Pimelia, Myoporum, Gannet, Fig Islands and Bloodwood. Fairy tern (*Sterna nereis*) historical breeding on Fairy Tern Island and Hibbertia. Crested tern (*Sterna bergii*) significant historical breeding on Daisy, Epsilon and Flag Burbidge et al. 2000)..	Wedge-tailed shearwater and bridled tern nest in summer (Nicholson 2002). Silver gull nest in summer and Autumn (Nicholson 2002). Caspian tern nest in autumn and winter (Nicholson 2002). Crested tern, lesser crested tern, roseate tern and sooty tern nest in Autumn (Nicholson 2002). Fairy tern nest in winter and spring (Nicholson 2002).

Location	Receptor	Background	Key locations	Seasonality
	Turtle	Loggerhead (*Caretta caretta*) and green (*Chelonia mydas*) (*significant rookeries*); hawksbill (*Eretmochelys imbracata*), flatback (*Natator depressus*) turtles (Burbidge et al. 2000) Flatback are common in the waters surrounding the Montebello Islands (Burbidge et al. 2000) and nesting occurs for the following species (Commonwealth of Australia 2017): • Green turtle • Flatback • Hawksbill	Hawksbill- Ah Chong Island, South East Island, Trimouille and elsewhere.	Green turtle- major nesting Nov – Mar (peak: Dec-May) on locations with sandy beaches (recovery plan) Flatback- minor nesting occurs Oct-Mar (peak: Nov-Jan) Hawksbill- major nesting occurs all year (peak Oct-Jan)
	Cetaceans	Whale species that may occasionally visit include the humpback whale (*Megaptera novaeangliae*), short-finned pilot whale (*Globicephala macrorhynchus*), false killer whale (*Pseudorca crassidens*), killer whale (*Orcinus orca*), minke whale (*Balaenoptera acutorostrata*), Bryde's whale (*Balaenoptera edeni*), sei whale (*Balaenoptera borealis*), pygmy blue whale (*Balaenoptera musculus brevicauda*), fin whale (*Balaenoptera physalus*), melon-headed whale (*Peponocephala electra*), sperm whale (*Physeter macrocephalus*) and the blue whale (*Balaenoptera musculus musculus*). (DEC 2006). Pygmy blue whale (*Balaenoptera musculus brevicauda*) and humpback whale (*Megaptera novaeangliae*) migration area Humpback dolphins (*Sousa sahulensis*) thought to be present year-round in the area (Raudino et al. 2018)	An area of sheltered water to the west of Trimouille Island is used as a resting area for female humpback whales and their young calves during their southerly migration (DEC 2006).	-
	Dugong	Dugong (*Dugong dugon*) significant sightings (Bancroft et al. 2000)	-	-
Muiron Islands	Birds	Nesting area for seabirds Wedge-tailed shearwater (*Ardenna pacifica*) nesting colony, birds forage at sea in large aggregations. Crested tern (*Thalasseus bergii*) nesting colony (Department of Parks and Wildlife 2014) Identified as an internationally important shorebird area (Weller et al. 2020).	-	Wedge-tailed shearwater are believed to stay in the area year-round, but undertake significant flights away from the islands around May. Returning around June, they nest in burrows on both islands spending several months preparing and re-excavating the burrows. At about 1 m long and not very deep,

Location	Receptor	Background	Key locations	Seasonality
				the burrows are subject to collapse by foot traffic. A single egg is laid around October and the chicks hatch in January (DPaW 2015).
	Turtle	Major loggerhead turtle (*Caretta caretta*) nesting site, significant green turtle (*Chelonia mydas*) nesting site, low density hawksbill turtle (*Eretmochelys imbricata*) nesting site, occasional flatback turtle (*Natator depressus*) presence	-	Loggerhead turtle peak nesting: November to January (Waayers 2010). Green turtle peak nesting December to January (Waayers 2010).
Ningaloo Coast World Heritage Area	Mangroves	Mangroves are not extensive.	On the east side of the Cape Range peninsula, a fringing mangal of Avicennia marina occurs to the south of Cape Murat, between Bundegi Reef and Exmouth. On the west side of the Peninsula, mangals occur at Mangrove Bay (*A. marina, Rhizophora stylosa and Bruguiera exaristata*), Low Point (*Avicennia marina*) and Yardie Creek (*A. marina and R. stylosa*)	-
	Manta rays	-	-	Ningaloo Reef is considered an important area for Manta Rays in autumn and winter (Preen et al. 1997).
	Whale sharks	Whale Sharks aggregate in the waters of the Ningaloo Marine Park, frequently close to the Ningaloo Reef front. The aggregations coincides with the period when the Leeuwin Current is strongest. (Sleeman et al. 2010). The whale sharks that visit Ningaloo are mostly immature males (Sequerira et al. 2016).	-	Peak visibility April to July (noting that whale sharks may be present throughout the year)
	Turtle	Four species of turtle nest in Ningaloo: Green turtle (*Chelonia mydas*), Flatback turtle (*Natator depressus*), Hawksbill turtle (*Eretmochelys imbricata*), Loggerhead turtle (*Caretta caretta*)	The most concentrated area of green turtle nesting is along the northern beaches and Muiron Islands, while loggerhead nesting is concentrated along beaches further south	Main nesting: Hawksbill July-Mar Green Sept-Mar Flatback Sept-Mar

Location	Receptor	Background	Key locations	Seasonality
			(Bungelup, Jane's Bay, Gnaraloo) and on South Muiron Island (Whiting 2016)	Loggerhead Sept-Mar
	Marine mammals	Two species of dolphins are resident at Ningaloo, the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) and the Australian humpback dolphin (*Sousa sahulensis*) (Allen et al. 2012, Jefferson and Rosenbaum 2014). Humpback whales (*Megaptera novaeangliae*) and pygmy blue whales (*Balaenoptera musculus brevicauda*) migrate past Ningaloo each year on their way to breeding grounds further north, and back again (Jenner et al. 2001; Double et al. 2014). (Note: an increasing number of humpback calves are being born at or near Ningaloo each year (Irvine et al. 2018). The waters off Ningaloo are a possible foraging BIA for pygmy blue whales (Thums et al. 2022). Killer whales (*Orcinus orca*) prey on humpback whale calves and are regularly present during the southern migration of humpback whales each year (Pitman et al. 2014).	Indo-Pacific bottlenose dolphins have been found to be primarily associated with the 20 m contour and the Muiron Islands (Hanf 2015). A relatively dense population of have been observed around the North West Cape, suggesting that this region is of high importance to this species (Haughey et al. 2020) Humpback dolphins tend to be associated with intertidal and shallow coastal waters, as well as offshore islands (Hanf 2015). Dugong mostly inhabit the shallow 90-5 m) waters fringing the coast and offshore islands, occurring in close conjunction with the seagrass and algae beds on which they feed.	Humpback whales: June through to the end of October Pygmy blue whales: April to June
	Birds	Identified as an internationally important shorebird area (Weller et al. 2020). Approximately 30 bird species listed under (JAMBA), China–Australia Migratory Bird Agreement (CAMBA) and/or Republic of Korea- Australia Migratory Bird Agreement (ROKAMBA) have been recorded in the Cape Range National Park (DEC 2010). Habitats including the shallow sandy intertidal beaches and rocky shorelines of the Ningaloo coast are important for seabirds and waders to breed, rest and feed (Shire of Exmouth et al. 1999).	Significant seabird rookeries include Cape Farquhar, Pelican Point, Point Maud and Winderabandi Point (Shore of Exmouth et al. 1999).	Juvenile shorebirds can be found year-round. Adults shorebirds usually between August and April.
Southern Islands Coast	Sediment	The Department of Environment and Conservation (DEC) investigated background contaminants in Sediments of the	-	-

Location	Receptor	Background	Key locations	Seasonality
(Southern Pilbara shoreline, Onslow area coastline)		Pilbara in 2005 (DEC 2006). Sediment samples were collected from coastal waters at Port Hedland, Dampier Archipelago, Onslow, Ashburton River Mouth and Exmouth Gulf. Samples were analysed for TBT, PAHs, TPH, BTEXN, organochlorin pesticides, PCBs, total metals and metalloids. Background sediment quality was found to be high. Total arsenic were found in high concentrations in one site off Onslow (considered natural and likely to be related to geology of the region.		
	Mangroves	Mangroves in the area form small but sometimes complex communities in embayments and on the sheltered shores of many offshore islands.	Juvenile green turtles are known to forage on mangroves and have been recorded in both Urala Creek North and Urala Creek South (AECOM 2022).	-
	Turtle	Recovery Plan for Marine Turtles in Australia 2017-2027 (Commonwealth of Australia 2017) has listed critical nesting habitat in this area for Green turtle (*Chelonia mydas*), Flatback turtle (*Natator depressus*), Hawksbill turtle (*Eretmochelys imbricata*) and Loggerhead turtle (*Caretta caretta*). Flatback BIA for nesting and internesting (DCCEEW 2023). Internesting BIA for green and loggerhead turtle (DCCEEW 2023).	Thevenard Island is an important nesting area (Commonwealth of Australia 2017).	Nesting and hatching takes place between October and April. Flatback turtle nesting in the Ashburton area occurs between October and February, with peak nesting activity in December (Imbricata 2013).
	Marine mammals	Key species (O2 Marine 2021) : humpback whale (*Megaptera novaeangliae*), dugong (*Dugong dugon*), Australian humpback dolphin (*Sousa sahulensis*), Indo-Pacific bottlenose dolphin (*Tursiops aduncus*). Dugongs are resident in coastal waters of the Pilbara coast and are sighted year-round, having a strong association with seagrass habitat. BIAs (DCCEEW 2023): Humpback whale: migration and resting. Pygmy blue whale: distribution.	-	-

Location	Receptor	Background	Key locations	Seasonality
	Birds	Key species (O2 Marine 2021): Australian fairy tern (*Sternula nereis*), bar-tailed godwit- critically endangered (*Limosa lapponica menzbieri*), curlew sandpiper – critically endangered (*Calidris ferruginea*), eastern curlew- critically endangered (*Numenius madagascariensis*) Breeding and foraging BIA of Wedge-tailed shearwater (DCCEEW 2023).	-	Juvenile shorebirds can be found year-round. Adults shorebirds usually between August and April.

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Appendix B: OSM baseline data sources

Table D-1: Baseline data sources

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
Water quality	Chevron (2019) Wheatstone Effluent Quality Validation Report, Rev 0- 20200909 (ABU200900381)	Chevron	Onslow area
	Chevron (2022) MEQMP Compliance report and data (ABU221200858)	Chevron	Barrow Island
	Chevron (2022) Wheatstone Platform Environmental Monitoring Program – draft report. 60672341 Wheatstone 5 Yearly Monitoring Technical Report- Rev A	Chevron	Wheatstone Platform
	Chevron (2018) Wheatstone Platform Waste Water Discharges Model Verification Report (ABU190601699)	Chevron	Wheatstone Platform
	Chevron (2022) Gorgon Backfill Fields Benthic Survey 2022 (ABU230100068)	Chevron	Gorgon Backfill Fields
	Pilbara Ports Authority (2019) Marine Environmental Quality Program	Pilbara Ports Authority	Dampier Dampier Archipelago Port Hedland
	O2 Marine (2020) Mardie Project- Marine Water Quality. Prepared for Mardie Minerals Pty Ltd. Report Number R190056	O2 Marine	Mardie
	Port of Broome- Ongoing Marine Monitoring Program. By O2 Marine for Kimberley Ports Authority	Kimberley Ports Authority	Broome Kimberley
	Proposed Browse to North West Shelf Project, Appendix D.1: Browse to NWS Project Trunkline Route Surveys (2019) Environmental Survey Report. Neptune Document J11200-1-RR-006	Advisian/Neptune	Kimberley Marine Park Continental Slope Demersal Fish KEF Agro-Rowley Terrace Marine Park Ancient Coastline at 125 m Depth Contour KEF

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
Sediment quality	Chevron (2019) Wheatstone LNG Project Mangrove Monitoring Program 2019 (ABU200800053)	Chevron	Onslow
	Chevron (2022) MEQMP 2022 Compliance report and data (ABU221200858)	Chevron	Barrow Island
	Chevron (2022) Wheatstone Platform Environmental Monitoring Program – DRAFT REPORT 60672341, Wheatstone Platform 5 Yearly Monitoring Technical Report-Rev A	Chevron	Wheatstone Platform
	Chevron (2022) Gorgon Backfill Fields Benthic Survey 2022 (ABU230100068)	Chevron	Gorgon Backfill Fields
	Pilbara Ports Authority (2019) Marine Environmental Quality Program	Pilbara Ports Authority	Dampier Dampier Archipelago Port Hedland
	O2 Marine (2019). Mardie project- Sediment Sampling and Analysis Plan Results. Prepared for Mardie Minerals Pty Ltd. Report Number R190033	O2 Marine	Mardie
	O2 Marine and Teal Solutions (2019). Port Hedland Spoilbank Marina Sediment Sampling and Analysis Plan Implementation Report. Prepared for the Department of Transport. Report Number R190209	O2 Marine	Port Hedland
	Jones R, Wakeford M, Currey-Randall L, Miller K, Tonin H (2021) Drill cuttings and drilling fluids (muds) transport, fate and effects near a coral reef mesophotic zone. Marine Pollution Bulletin 172, 112717	AIMS	Glomar Shoal Rankin Bank
	O2 Marine (2021) Ashburton Infrastructure Project Sediment Sampling and Analysis Plan, Fremantle, WA. Prepared for Mineral Resource Limited	O2 Marine	Ashburton Onslow area
	Advisian (2019) Scarborough Sediment Sampling and Analysis Plan Implementation Report. Prepared for Woodside	Woodside	Dampier
	Woodside (ongoing unpublished data) Chemical and Ecological Monitoring of Mermaid Sound	Woodside	Burrup Peninsula Dampier
	Port of Broome- Ongoing Marine Monitoring Program. By O2 Marine for Kimberley Ports Authority	Kimberley Ports Authority	Broome Kimberley
	Proposed Browse to North West Shelf Project, Appendix D.1: Browse to NWS Project Trunkline Route Surveys (2019) Environmental Survey Report. Neptune Document J11200-1-RR-006	Advisian/Neptune	Kimberley Marine Park Continental Slope Demersal Fish KEF

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Agro-Rowley Terrace Marine Park Ancient Coastline at 125 m Depth Contour KEF
Intertidal and coastal habitats	Chevron (2019) Wheatstone LNG Project Mangrove Monitoring Program 2019 (ABU200800053)	Chevron	Onslow
	DBCA (long-term monitoring) Ningaloo Reef Program	DBCA	Ningaloo
	360 Environmental (2017) Learmonth Habitat Surveys. Prepared for Subsea 7	Subsea 7	Exmouth Gulf
	Woodside (ongoing unpublished data) Chemical and Ecological Monitoring of Mermaid Sound	Woodside	Burrup Peninsula Dampier
	AECOM (2022) Assessment of Benthic Communities and Habitats Ashburton Salt Project. Prepared for K + S Australian Pty Ltd. Doc No. 60692048_4.	K + S Australian Pty Ltd	Ashburton Onslow area
	Reef R and Lovelock C (2019). Characteristics of landward expansion of mangrove forests with sea level rise. Geophysical Research Abstracts 21(1), 1.	Monash University	Exmouth Gulf
	DBCA (2019) Ecological monitoring in the Shark Bay marine reserves, DBCA, Perth.	DBCA	Shark Bay
	Sutton AL and Shaw LL (2020) A snapshot of Marine Research in Shark Bay (Gathaagudu): Literature Review and Metadata Collection (1949-2020). West Australian Marine Science Institution, 180.	WAMSI	Shark Bay
	Sutton AL and Shaw JL (2021) Cumulative Pressures on the Distinctive Values of Exmouth Gulf. First draft report to the Department of Water and Environmental Regulation by the Western Australian Marine Science Institution, Perth, Western Australia. 272 pages.	WAMSI	Exmouth Gulf
	DBCA (2023) DBCA Annual Report 2022–23, Department of Biodiversity, Conservation and Attractions, Perth. Primary productivity and energy transfer between marine ecosystems (SP 2020-002)	DBCA	Dampier Archipelago
	Lincoln G, Mathews D, Oades D with the Balanggarra, Bardi Jawi, Dambimangari, Karajarri, Mayala, Nyangumarta, Nyul Nyul, Wunambal Gaambera and Yawuru ISWAG members (2021) The Kimberley Indigenous Turtle and Dugong Initiative 2021-2031. Prepared by Mosaic Environmental for the Kimberley Indigenous Saltwater Advisory Group (ISWAG) Broome 2021	Coordinated by the Kimberley Indigenous Saltwater Advisory Group, implemented by Kimberley	Kimberley

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
		Saltwater Communities, supported by Western Science Partners	
	Astron Environmental Services (2021) Varanus and Bridled Islands Mangrove Monitoring – Annual Report 2020, unpublished report to Santos WA Energy Limited	Santos	Varanus Island Bridled Island
	Ground-truthing satellite imagery that is utilised to monitor mangrove extent/density at Montebello Islands	DBCA	Montebello Islands
	Port of Broome- Ongoing Marine Monitoring Program. By O2 Marine for Kimberley Ports Authority	Kimberley Ports Authority	Broome Kimberley
	WAMSI- Mardie Off Set Plan	WAMSI	Pilbara Coast Gnoorea Yammadery Onslow Giralia Bay
Benthic habitat	Chevron (2019) Jansz-Io Subsea Compression Benthic Video Footage Review (G7-NT-REPX0000239)	Chevron	Jansz-Io Field
	Chevron (2022) WHS Platform Environmental Monitoring Program – DRAFT REPORT 60672341, Wheatstone Platform 5 Yearly Monitoring Technical Report-Rev A	Chevron	Wheatstone Platform
	Chevron (2022) Gorgon Backfill Fields Benthic Survey (ABU230100068)	Chevron	Gorgon Backfill Fields
	Chevron (2023) Thevenard Island Retirement Project Heavy Lift Vessel Anchor Spread Benthic Habitat Mapping-Survey Report	Chevron	Thevenard Island
	DBCA (long-term monitoring) Ningaloo Reef Program	DBCA	Ningaloo
	Wahab MA, Radford B, Cappo M, Colquhoun J, Stowar M, Depczynski M, Miller K, Heyward A (2018) Biodiversity and spatial patterns of benthic habitat and associated demersal fish communities at two tropical submerged reef ecosystems. Coral Reefs, 37, 327-343, 10.1007/s00338-017-1655-9	AIMS	Glomar Shoal Rankin Bank
	O2 Marine (2019). Mardie project- Sediment Sampling and Analysis Plan Results. Prepared for Mardie Minerals Pty Ltd. Report Number R190033	O_2 Marine	Mardie

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	O2 Marine (2019). Mardie Project – Subtidal Benthic Communities and Habitat Baseline Assessment. Prepared for Mardie Minerals Pty Ltd. Report Number R190045.	O_2 Marine	Mardie
	Jones R, Wakeford M, Currey-Randall L, Miller K, Tonin H (2021) Drill cuttings and drilling fluids (muds) transport, fate and effects near a coral reef mesophotic zone. Marine Pollution Bulletin 172, 112717	AIMS	Glomar Shoal Rankin Bank
	O2 Marine (2021) Benthic Communities and Habitat Ashburton Infrastructure Project, Fremantle, WA. Prepared for Mineral Resources Limited	O_2 Marine	Ashburton Onslow area
	O2 Marine (2021). Onslow Seawater Desalination Plant. Benthic Communities and Habitat. Report No. R200065. Prepared for the Water Corporation.	O_2 Marine	Onslow area
	360 Environmental (2017) Learmonth Habitat Surveys. Prepared for Subsea 7	Subsea 7	Exmouth Gulf
	Advisian (2019) Dampier Archipelago Commonwealth Waters Marine Benthic Habitat Survey. Prepared for Woodside Energy Ltd	Woodside	Dampier Archipelago
	MScience (2019) Scarborough Trunkline Marine Environmental Studies- Pre-dredging Coral Habitat Assessment. Report to Advisian	Advisian	Dampier Archipelago Dampier Angle Island Burrup Peninsula Conzinc Island Gidley Island Intercourse Island Malus Island Middle Island
	Woodside (ongoing unpublished data) Chemical and Ecological Monitoring of Mermaid Sound	Woodside	Burrup Peninsula Dampier
	AECOM (2022) Assessment of Benthic Communities and Habitats Ashburton Salt Project. Prepared for K + S Australian Pty Ltd. Doc No. 60692048_4.	K + S Australian Pty Ltd	Ashburton Onslow area
	O2 Marine and Teal Solutions (2019) Port Hedland Spoilbank Marina Sediment Sampling and Analysis Plan Implementation Report. Prepared for the Department of Transport. Report Number R190209	O_2 Marine	Port Hedland
	BMT (2020) Technical Note. Learmonth Benthic Habitat Survey. Prepared for MBS Environmental	BMT	Exmouth Gulf

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Advisian (2019) Scarborough Offshore Benthic Marine Habitat Assessment. Prepared for Woodside	Woodside	Scarborough permit area WA-1-R
	Advisian (2019) Montebello Marine Park Benthic Habitat Survey ROV Analysis of the Scarborough Pipeline Route. Prepared for Woodside	Woodside	Montebello Australian Marine Park
	Moustaka M, Mohring M, Holmes T, Evans R , Thomson D, Nutt C, Stoddart J, Wilson S (2019) Cross-shelf Heterogeneity of Coral Assemblages in Northwest Australia, Diversity, vol. 11, 15pp.	DBCA Marine Science	Dampier Archipelago Regnard Island Eaglehawk Island Dockrell Reef Enderby Island Goodwyn Island Malus Island Conzinc Island Gidley Island Hammersley Shoal Legendre Island Delambre Island
	Thompson DP, Babcock RC, Evans RD, Feng M, Moustaka M, Orr M, Slawinski D, Wilson S, Hoey A (2021) Coral larval recruitment in north-western Australia predicted by regional and local conditions. Marine Environmental Research 168: 105318	CSIRO	Dampier Archipelago Regnard Island Eaglehawk Island Dockrell Reef Enderby Island Goodwyn Island Malus Island Conzinc Island Gidley Island

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Hammersley Shoal Legendre Island Delambre Island
	Adam A., Thomas L, Underwood J, Gilmour J, Richards Z (2022) Population connectivity and genetic offset in the spawning coral *Acropora digitifera* in Western Australia. Molecular Ecology.	Curtin University	Ashmore Reef Lalang-garram Marine Park Reefs Beagle Reef Adele Island Clerke Reef Mermaid Reef Imperieuse Reef Ningaloo Station Gnaraloo Quobba
	Doropoulos C, Gomez-Lemos LA, Salee K, McLaughlin MJ, Tebben J, Van Koningsveld M, Feng M, Babock R (2021). Limitations to coral recovery along an environmental stress gradient. Ecological Applications. 2022;32:e2558.	CSIRO	Exmouth Gulf Exmouth Ningaloo Coral Bay
	Edgeloe JM, Severn-Ellis AA, Bayer PE, Mehravi S, Breed MF, Krauss SL, Batley J, Kendrick GA, Sinclair EA. 2022. Extensive polyploid clonality was a successful strategy for seagrass to expand into a newly submerged environment. Proc. R. Soc. B20220538.https://doi.org/10.1098/rspb.2022.0538	UWA	Shark Bay
	McLean D and Birt M. (2021) Enhanced ROV survey of tropical fish and benthic communities associated with shallow oil and gas platforms. Research Square	AIMS	Varanus Island
	Sutton AL and Shaw LL (2020) A snapshot of Marine Research in Shark Bay (Gathaagudu): Literature Review and Metadata Collection (1949-2020). West Australian Marine Science Institution, 180.	WAMSI	Shark Bay
	Sutton AL and Shaw JL (2021) Cumulative Pressures on the Distinctive Values of Exmouth Gulf. First draft report to the Department of Water and Environmental Regulation by the Western Australian Marine Science Institution, Perth, Western Australia. 272 pages.	WAMSI	Exmouth Gulf

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	DBCA (2023), Biodiversity and Conservation Science Annual Report 2022–23, DBCA, Perth. Primary productivity and energy transfer between marine ecosystems (SP 2020-002)	DBCA	Dampier Archipelago
	DBCA (2023), Biodiversity and Conservation Science Annual Report 2022–23, DBCA, Perth. Understanding the key ecosystem services provided by the seagrass meadows of Western Australia (SP 2018-136)	DBCA	Shark Bay
	National Reef Monitoring Network	The IMOS National Reef Monitoring Network sub-Facility	Houtman Abrolhos Islands Ningaloo Coast World Heritage Area Exmouth Gulf Dampier Archipelago Island Group Barrow Island Montebello Islands Group Ashmore Reef Cartier Island Darwin Harbour Arafura Arnhem Marmion Rottnest Island Geographe Bay
	Ningaloo Outlook	CSIRO	Ningaloo Coast World Heritage Area
	Gilmour JP, Cook KL, Ryan NM, Puotinen ML, Green, RH, Shedrawi G, Hobbs J-P A, Thompson, DP, Badcock, R, Buckee J, Foster T, Richards ZT, Wilson SK, Barnes PB, Coutts TB, Radford BT, Piggott CH, Depczynski M, Evans SN, Schoepf V, Evans RD, Halford AR, Nutt CD, Bancroft KP, Heyward AJ, Oades D (2019) The state of Western Australia's coral reefs. Coral Reefs https://doi.org/10.1007/s00338-019-01795-8	AIMS	Western Australia Cocos Keeling Islands Ashmore Reef Scott Reef

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Rowley Shoals Montebello Islands Group Barrow Island Ningaloo Reef Shark Bay
	Lincoln G, Mathews D, Oades D with the Balanggarra, Bardi Jawi, Dambimangari, Karajarri, Mayala, Nyangumarta, Nyul Nyul, Wunambal Gaambera and Yawuru ISWAG members (2021) The Kimberley Indigenous Turtle and Dugong Initiative 2021-2031. Prepared by Mosaic Environmental for the Kimberley Indigenous Saltwater Advisory Group (ISWAG) Broome 2021	Coordinated by the Kimberley Indigenous Saltwater Advisory Group, implemented by Kimberley Saltwater Communities, supported by Western Science Partners	Kimberley
	Heyward A, Miller K, Fromont J, Keesing J, Parnum I (EDS.) (2018). Kimberley Benthic Biodiversity Synthesis Report of Project 1.1.1 prepared for the Kimberley Marine Research Program, Western Australian Marine Science Institution, Perth, Western Australia, 57pp.	WAMSI AIMS	Kimberley Camden Sound Bonaparte Archipelago Eclipse Archipelago Lalang-garram Marine Park Reefs
	Port of Broome- Ongoing Marine Monitoring Program. By O2 Marine for Kimberley Ports Authority	Kimberley Ports Authority	Broome Kimberley
	Biota Environmental Sciences (2019) Asian Renewable Energy Hub Environmental Review Document, Assessment Number 2140, Appendix 2 Benthic Communities and Habitat Survey. Prepared by BMT	BMT for Asian Renewable Hub (NW	Eighty Mile Beach

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
		Interconnected Power)	
	Proposed Browse to North West Shelf Project, Appendix D.1: Browse to NWS Project Trunkline Route Surveys (2019) Environmental Survey Report. Neptune Document J11200-1-RR-006	Advisian/Neptune	Kimberley Marine Park Continental Slope Demersal Fish KEF Agro-Rowley Terrace Marine Park Ancient Coastline at 125 m Depth Contour KEF
	O2 Marine (2020). Kimberley Marine Offloading Facility – Benthic Infauna Survey. O2 Marine Report Number T200073. Perth, Western Australia	O2 Marine	Broome Roebuck Bay
Marine fish and elasmobranchs	Chevron (2019) Jansz-Io Subsea Compression Benthic Video Footage Review (G7-NT-REPX0000239)	Chevron	Jansz-lo field
	Chevron (2021) Wheatstone Sawfish Progress Report	Chevron	Onslow area
	Chevron (2022) Gorgon Backfill Fields Benthic Survey 2022 (ABU230100068)	Chevron	Gorgon Backfill Fields
	DBCA (long-term monitoring) Ningaloo Reef Program	DBCA	Ningaloo
	Wahab MAA, Radford B, Cappo M, Colquhoun J, Stowar M, Depczynski M, Miller K, Heyward A (2018) Biodiversity and spatial patterns of benthic habitat and associated demersal fish communities at two tropical submerged reef ecosystems Coral Reefs, 37, 327-343, 10.1007/s00338-017-1655-9	AIMS	Glomar Shoal Rankin Bank
	Jones R, Wakeford M, Currey-Randall L, Miller K, Tonin H (2021) Drill cuttings and drilling fluids (muds) transport, fate and effects near a coral reef mesophotic zone. Marine Pollution Bulletin 172, 112717	AIMS	Glomar Shoal Rankin Bank
	Morgan D, Lear K, Norman B (2020) Sawfish surveys Urala Creek, Exmouth Gulf, February 2019. Report to AECOM. Centre for Sustainable Aquatic Ecosystems, Harry Butler Institute, Murdoch University, Perth, Western Australia	Murdoch University	Ashburton Exmouth Gulf

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Schramm KD, Marnane MJ, Elsdon TS, Jones CM, Saunders BJ, Newman SJ, Harvey ES (2021) Fish associations with shallow water subsea pipelines compared to surrounding reef and soft sediment habitats. Sci Rep 11, 6238 . https://doi.org/10.1038/s41598-021-85396-y	Curtin University	Thevenard Island
	Galaiduk R, Radford B, Case M, Bond T, Taylor M, Cooper T, Smith L and McLean D (2022) Regional patterns in demersal fish assemblages among subsea pipelines and natural habitats across north-west Australia. Front. Mar. Sci. 9:979987. doi: 10.3389/fmars.2022.979987	AIMS	Rankin Bank Glomar Shoal Thevenard Island
	Currey-Randall LM, Galaiduk R, Stowar M, Vaughan BI, Miller KJ (2021) Mesophotic fish communities of the ancient coastline in Western Australia. PLoS ONE 16(4): e0250427. https://doi. org/10.1371/journal.pone.0250427	AIMS	Locations associated with the ancient coastline KEF at depths greater than 125 m
	McLean D and Birt M. (2021) Enhanced ROV survey of tropical fish and benthic communities associated with shallow oil and gas platforms. Research Square	AIMS	Varanus Island
	McLean DL, Vaughan BI, Malseed BE, Taylor MD (2020) Fish-habitat associations on a subsea pipeline within an Australian Marine Park, Marine Environmental Research 123, 104813	AIMS	Montebello Australian Marine Park
	Sutton AL and Shaw LL (2020) A snapshot of Marine Research in Shark Bay (Gathaagudu): Literature Review and Metadata Collection (1949-2020). West Australian Marine Science Institution, 180.	WAMSI	Shark Bay
	Sutton AL and Shaw JL (2021) Cumulative Pressures on the Distinctive Values of Exmouth Gulf. First draft report to the Department of Water and Environmental Regulation by the Western Australian Marine Science Institution, Perth, Western Australia. 272 pages.	WAMSI	Exmouth Gulf
	DBCA (2023), Biodiversity and Conservation Science Annual Report 2022–23, Department of Biodiversity, Conservation and Attractions, Perth. Benefits of marine parks for marine fishes in a changing climate (SP 2021-040)	DBCA	WA State Marine Parks
	DBCA (2023), Biodiversity and Conservation Science Annual Report 2022–23, Department of Biodiversity, Conservation and Attractions, Perth. Do marine reserves adequately represent high diversity cryptobenthic fish assemblages in a changing climate? (SP 2019-031)	DBCA	Ningaloo
	National Reef Monitoring Network	The IMOS National Reef Monitoring	Houtman Abrolhos Islands

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
		Network sub-Facility	Ningaloo Coast World Heritage Area Exmouth Gulf Dampier Archipelago Island Group Barrow Island Montebello Islands Group Ashmore Reef Cartier Island Darwin Harbour Arafura Arnhem Marmion Rottnest Island Geographe Bay
	Lear KO, Ebner BC, Fazeldean T, Bateman RL, Morgan DL (2024) Effects of coastal development on sawfish movements and the need for marine animal crossing solutions. Conservation Biology, e14263. https://doi.org/10.1111/cobi.14263	Murdoch University	Onslow area
	Feutry P, Laird A, Davies CL, Devloo-Delva F, Fry G, Johnson G, Gunasekara RM, Marthick J, Kyne PM (2021) Population structure of Narrow Sawfish *Anoxypristis cuspidata* across northern Australia. Report to the National Environmental Science Program Marine Biodiversity Hub. CSIRO, Charles Darwin University, and NPF Industry Pty Ltd.	CSIRO	Kimberley Northern Territory coastline
	Heupel M, Simpfendorfer C, Chin A, Appleyard S, Barton D, Green M, Johnson G, McAuley R and White W (2020) Examination of connectivity of hammerhead sharks in northern Australia. Report to the National Environmental Science Program, Marine Biodiversity Hub. Australian Institute of Marine Science.	AIMS	Exmouth Gulf Broome
	Morgan DL, Lear KO, Dobinson E, Gleiss AC, Fazeldean T, Pillans RD, Beatty SJ and Whitty JM (2021) Seasonal use of a macrotidal estuary by the endangered dwarf sawfish, *Pristis clavata*. Aquatic Conservation Marine and Freshwater Ecosystems 31(8):2164–2177. doi: 10.1002/aqc.3578	CSIRO	Kimberley Fitzroy River King Sound

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Port of Broome- Ongoing Marine Monitoring Program. By O2 Marine for Kimberley Ports Authority	Kimberley Ports Authority	Broome Kimberley
	West K, Travers MJ, Stat M, Harvey ES, Richards ZT, DiBattista JD, Newman SJ, Harry A, Skepper CL, Heydenrych M, Bunce M (2021) Large-scale eDNA metabarcoding survey reveals marine biogeographic break and transitions over tropical north-western Australia. Divers Distrib. 27: 1942–1957. https://doi.org/10.1111/ddi.13228	Trace and Environmental DNA (TrDNA) Laboratory, Curtin University	Kimberley
Fisheries	Sutton AL and Shaw JL (2021) Cumulative Pressures on the Distinctive Values of Exmouth Gulf. First draft report to the Department of Water and Environmental Regulation by the Western Australian Marine Science Institution, Perth, Western Australia. 272 pages.	WAMSI	Exmouth Gulf
	DBCA (2023), Biodiversity and Conservation Science Annual Report 2022–23, Department of Biodiversity, Conservation and Attractions, Perth. Benefits of marine parks for marine fishes in a changing climate (SP 2021-040)	DBCA	WA State Marine Parks
	DBCA (2023), Biodiversity and Conservation Science Annual Report 2022–23, Department of Biodiversity, Conservation and Attractions, Perth. Do marine reserves adequately represent high diversity cryptobenthic fish assemblages in a changing climate? (SP 2019-031)	DBCA	Ningaloo
	National Reef Monitoring Network	The IMOS National Reef Monitoring Network sub-Facility	Houtman Abrolhos Islands Ningaloo Coast World Heritage Area Exmouth Gulf Dampier Archipelago Island Group Barrow Island Montebello Islands Group Ashmore Reef Cartier Island Darwin Harbour Arafura Arnhem

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Marmion Rottnest Island Geographe Bay
	State of the Fisheries Report (Western Australia)	DPIRD	WA's major commercial and recreational fisheries
	DPIRD (2020). Western Australian Marine Stewardship Council Report Series No. 16: Ecological Risk Assessment of the Shark Bay Invertebrate Fisheries. DPIRD, Western Australia.	DPIRD	Shark Bay
	Bartes S and Braccini JM (2021) Potential expansion in the spatial distribution of subtropical and temperate west Australian sharks. Journal of Fish Biology. doi:10.1111/jfb.14822	DPIRD	Fisheries included: Bigeye sixgill (*Hexanchus nakamurai*) Tiger shark (*Galeocerdo cuvier*) Spinner shark (*Carcarhinus brevipinna*) Scalloped hammerhead (*Sphyrna lewini*) Broadnose sevengill sharks (*Notorhyncus cepedianus*) Southern sawsharks (*Pristiophorus nudipinnis*)

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Langlois TJ, Wakefield CB, Harvey ES, Boddington DK and Newman SJ (2021). Does the benthic biota or fish assemblage within a large targeted fisheries closure differ to surrounding areas after 12 years of protection in tropical north-western Australia? Marine Environmental Research 170: 105403.	DPIRD	Fishery: Pilbara demersal scalefish fisheries
	Yeoh D, Johnston D and Harris D (2021) Squid and cuttlefish resources of Western Australia. Fisheries Research Report No. 314 Department of Primary Industries and Regional Development, Western Australia. 101pp	DPIRD	Squid and cuttlefish
	DPIRD (2020) Western Australian Marine Stewardship Council Report Series No. 17: Ecological Risk Assessment of the Exmouth Gulf Prawn Managed Fishery. DPIRD, Western Australia.	DPIRD	Exmouth Gulf
	Ryan KL, Lai EKM, Smallwood CB (2022) Boat-based recreational fishing in Western Australia 2020/21. Fisheries Research Report No. 327 Department of Primary Industries and Regional Development, Western Australia. 221pp.	DPIRD	
	Sutton AL and Shaw LL (2020) A snapshot of Marine Research in Shark Bay (Gathaagudu): Literature Review and Metadata Collection (1949-2020). West Australian Marine Science Institution, 180.	WAMSI	Shark Bay
	Meteyard, B (2024) Northern Prawn Fishery Data Summary 2023. NPF Industry Pty Ltd, Australia	Northern Prawn Fishery PTY Ltd	Kimberley Northern Territory
	Lynch TP, Smallwood CB, Ochwada-Doyle FA, Lyle J, Williams J, Ryan KL, Devine C, Gibson B, Jordan A (2020) A cross continental scale comparison of Australian offshore recreational fisheries research and its applications to Marine Park and fisheries management. – ICES Journal of Marine Science, 77 (3): 1190–1205.	CSIRO	Australia wide
Reptiles	Chevron (2022) Gorgon Gas Development – Marine Turtle Monitoring Program 2021/22: Barrow Island and Mundabullangana ABU220800133	Chevron	Barrow Island Mundabullangana
	Wilson P, Thums M, Pattiaratchi C, Whiting S, Pendoley K, Ferreira L, Meekan M (2019) High predation of marine turtle hatchlings near a coastal jetty. Biological Conservation, 236	UWA/DBCA	Thevenard Island
	Rob D, Barnes P, Whiting S, Fossette S, Tucker T and Mongan T (2019) Turtle activity and nesting on the Muiron Islands and Ningaloo Coast: Final Report 2018, Ningaloo Turtle Program. Report prepared for Woodside Energy Limited. Department of Biodiversity, Conservation and Attractions, Exmouth, pp.51.	DBCA	Cape Range National Park North West Cape Muiron Islands North Muiron Island South Muiron Island Sunday Island

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Bungelup
	Tucker T, Whiting S, Fossette S, Rob D, Barnes P (2020). Inter-nesting and migrations by marine turtles of the Muiron Islands and Ningaloo Coast. Final Report. Prepared for Woodside Energy Limited. Department of Biodiversity, Conservation and Attractions, Perth. pp. 1-93	DBCA	Muiron Islands North Muiron Island South Muiron Island North West Cape Cape Range National Park Bungelup
	Ferreira LC, Thums M, Fossette S, Wilson P, Shimada T, Tucker A, Pendoley K, Waayers D. Guinea ML, Loewenthal G, King J, Speirs M, Rob D, Whiting SD (2020) Multiple satellite tracking datasets inform green turtle conservation at a regional scale. Diversity and Distribution 27: 249-266	AIMS	Rosemary Island Legendre Island Middle Passage Island Barrow Island Muiron Islands Ningaloo Coast World Heritage Area Montebello Islands Group Lacepede Islands Maret Island Scott Reef
	Fossette S, Loewenthal G, Peel LR, Vitenbergs A, Hamel MA, Douglas C, Tucker AD, Mayer F, Whiting SD (2021) Using Aerial Photogrammetry to Assess Stock-Wide Marine Turtle Nesting Distribution, Abundance and Cumulative Exposure to Industrial Activity. Remote Sens, 13, 1116.	DBCA	Y Island Locker Island Onslow Area Mainland Coast Ashburton Island Thevenard Island Barrow Island Long Island

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Dampier Mainland Coast Rosemary Island West Mid Intercourse Island East Lewis Island Legendre Island Hauy Island Delambre Island Karratha Downes Island Bedout Island Port Hedland Mainland Coast Mundabullangana Cape Lambert Exmouth Gulf
	Pendoley Environmental (2018). Marine turtle survey of Mardie Salt Project Area – December 2017. January 2018. Prepared for Phoenix Environmental	Pendoley Environmental	Mardie
	Pendoley Environmental (2019). Mardie Salt Project: Marine turtle monitoring program 2018/2019. April 2019. Prepared for BCI Minerals Ltd.	Pendoley Environmental	Mardie Angle Island Long Island Middle Island Round Island Sholl Island
	Ningaloo Turtle Program	DBCA	North West Cape Cape Range National Park Bungelup
	Rosemary Island Turtle Monitoring Program	DBCA	Rosemary Island
	West Pilbara Turtle Program	DBCA	Karratha

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Cleaverville Wickham
	North West Shelf Flatback Turtle Monitoring Program	DBCA	Thevenard Island Delambre Island Karratha Port Hedland Mainland Coast Eighty Mile Beach Echo Beach Cable Beach Cape Domett
	Care for Headland Turtle Program	Care for Hedland	Port Hedland area
	Dirk Hartog Island Loggerhead Monitoring	DBCA	Dirk Hartog Island
	AECOM (2022) Marine Fauna Impact Assessment Ashburton Salt Project. Doc No. 60597242_3	AECOM	Ashburton Locker Island
	Keesing, J.K. (Ed.) (2019). Benthic habitats and biodiversity of the Dampier and Montebello Australian Marine Parks. Report for the Director of National Parks. CSIRO, Australia	CSIRO	Dampier Marine Park Montebello Australian Marine Park
	Gammon M, Whiting S, Fossette S (2023) Vulnerability of sea turtle nesting sites to erosion and inundation: A decision support framework to maximize conservation. Ecosphere, 14(6), e4529. https://doi.org/10.1002/ecs2.4529	UWA/DBCA	Y Island Locker Island Onslow Area Mainland Coast Ashburton Island Thevenard Island Barrow Island Long Island Dampier Mainland Coast

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Rosemary Island West Mid Intercourse Island East Lewis Island Legendre Island Hauy Island Delambre Island Karratha Downes Island Bedout Island Port Hedland Mainland Coast Mundabullangana Cape Lambert
	FitzSimmons N N, Pittard SD, McIntyre N, Jensen MP, Guinea M, Hamann M, Kennett R, et al. (2020). Phylogeography, Genetic Stocks, and Conservation Implications for an Australian Endemic Marine Turtle. Aquatic Conservation 30 (3): 440–60. https://doi.org/10.1002/aqc.3270.	Griffith University/DBCA	Barrow Island Delambre Island Mundabullangana Port Hedland Mainland Coast Eighty Mile Beach Echo Beach Cape Domett
	Thums M, Udyawer V, Galaiduk R, Ferreira L, Streten C, Radford B (2021) Using Marine Turtles to Identify Habitat and Assess Connectivity of the North and North-West Marine Park Networks and Sea Country: Exploration Study of Data and Partnerships. Report prepared for Parks Australia. Australian Institute of Marine Science, Perth. 48pp.	AIMS	Miaboolya Beach Quobba Shark Bay Ningaloo Coast World Heritage Area Muiron Islands Barrow Island

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Great Sandy Island Eighty Mile Beach Scott Reef Kimberley Roebuck Bay Joseph Bonaparte Gulf Lalang-garram Marine Park Reefs Oceanic Shoals Thevenard Island Echo Beach Montebello Islands Group Camden Sound Horizontal Falls
	Sutton AL and Shaw LL (2020) A snapshot of Marine Research in Shark Bay (Gathaagudu): Literature Review and Metadata Collection (1949-2020). West Australian Marine Science Institution, 180.	WAMSI	Shark Bay
	Sutton AL and Shaw JL (2021) Cumulative Pressures on the Distinctive Values of Exmouth Gulf. First draft report to the Department of Water and Environmental Regulation by the Western Australian Marine Science Institution, Perth, Western Australia. 272 pages.	WAMSI	Exmouth Gulf
	Fossette S, Ferreira L C, Whiting SD, King J, Pendoley K, Shimada T, Speirs M, Tucker A D, Wilson P, Thums M (2021) Movements and distribution of hawksbill turtles in the Eastern Indian Ocean. Global Ecology and Conservation, 29, e01713. https://doi.org/10.1016/j.gecco.2021.e01713	DBCA	Beacon Island Delambre Island Rosemary Island Varanus Island Montebello Islands Group
	Pillans RD, Whiting S, Tucker T, Vanderklift MA (2022) Fine-scale movement and habitat use of juvenile, subadult, and adult green turtles (*Chelonia mydas*) in a foraging ground at Ningaloo Reef, Australia. Aquatic Conservation: Marine and Freshwater Ecosystems 32 1323-1340	CSIRO	Ningaloo

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Gammon M, Whiting S, Fossette S (2023) Vulnerability of sea turtle nesting sites to erosion and inundation: a decision support framework to maximize conservation. Ecosphere 14: e4529	UWA/DBCA	Pilbara southern islands Pilbara northern islands Onslow area Thevenard Island Barrow Island Montebello Islands Dampier Archipelago Karratha Mundabullangana Cemetery Beach
	Ferreira LC, Thums M, Whiting S, Meekan M, Andrews-Goff V, Attard CRM, Bilgmann K, Davenport A, Double M, Falchi F, Guinea M, Hickey SM, Jenner C, Jenner M, Loewenthal G, McFarlane G, Möller LM, Norman B, Peel L, Pendoley K, Radford B, Reynolds S, Rossendell J, Tucker A, Waayers D, Whittock P, Wilson P and Fossette S (2023) Exposure of marine megafauna to cumulative anthropogenic threats in north-west Australia. Front. Ecol. Evol. 11:1229803. doi: 10.3389/fevo.2023.1229803	AIMS	Pilbara coast Kimberley Northern Territory coastline
	Ningaloo Outlook	CSIRO	Ningaloo Coast World Heritage Area
	Lambourne RN (2019) Classifying the diving behaviour of flatback turtles (*Natator depressus*) from multi-sensor tags. Honours thesis, Murdoch University	Murdoch University	Thevenard Island
	Udyawer V, D'Anastasi B, McAuley R, Heupel M (2016) Exploring the status of Western Australia's sea snakes. National Environmental Science Programme	AIMS	Shark Bay Ningaloo Coast World Heritage Area Port Hedland Rowley Shoals Oceanic Shoals

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Lincoln G, Mathews D, Oades D with the Balanggarra, Bardi Jawi, Dambimangari, Karajarri, Mayala, Nyangumarta, Nyul Nyul, Wunambal Gaambera and Yawuru ISWAG members (2021) The Kimberley Indigenous Turtle and Dugong Initiative 2021-2031. Prepared by Mosaic Environmental for the Kimberley Indigenous Saltwater Advisory Group (ISWAG) Broome 2021	Coordinated by the Kimberley Indigenous Saltwater Advisory Group, implemented by Kimberley Saltwater Communities, supported by Western Science Partners	Kimberley
	Tucker AD, Pendoley KL, Murray K, Loewenthal G, Barber C, Denda J, Lincoln G, Mathews D, Oades D, Whiting SD et al. (2021) Regional Ranking of Marine Turtle Nesting in Remote Western Australia by Integrating Traditional Ecological Knowledge and Remote Sensing. Remote Sensing. 13(22):4696. https://doi.org/10.3390/rs13224696	DBCA WAMSI	Kimberley
	Santos Varanus Island Turtle Monitoring Program	Santos	Varanus Island
	Bayliss P, Raudino H, Hutton M, Murray K, Waples K and Strydom S (2019) Modelling the spatial relationship between dugon (Dugong dugon) and their seagrass habitat in Shark Bay Marine Park before and after the marine heatwave of 2010/11. Department of Agriculture, Water and the Environment Final Report 2.	CSIRO DBCA	Shark Bay Ningaloo Reef Exmouth Gulf
	Hounslow JL, Fossette S, Chong W, Bali R, Tucker AD, Whiting SD and Gleiss AC (2023) Behaviour-specific spatiotemporal patterns of habitat use by sea turtles revealed using biologging and supervised machine learning, Journal of Applied Ecology, 60(9):1828-1840. doi: 10.1111/1365-2664.14438	Murdoch University	Roebuck Bay
	West KM, Heydenrych M, Lines R, Tucker T, Fossette S, Whiting S and Bunce M (2023) Development of a 16S metabarcoding assay for the environmental DNA (eDNA) detection of aquatic reptiles across northern Australia, Marine and Freshwater Research 74(5):432-440. doi: 10.1071/MF20288	Curtin University	Roebuck Bay
	Whiting S, Tucker T, Pendoley K, Mitchell N, Bentley B, Berry O and FitzSimmons N (2018) Final Report of Proposal 1.2.2 prepared for the Kimberley Marine Research Program, Western Australian Marine Science Institution, Perth, Western Australia, 146 pp	DBCA WAMSI	Kimberley
	Thums Michele, Rossendell Jason, Fisher Rebecca, Guinea Michael L. (2020) Nesting ecology of flatback sea turtles *Natator depressus* from Delambre Island, Western Australia. Marine and Freshwater Research 71, 443-451.	AIMS	Delambre Island
	Schneider L, Tucker AD, Vincent K, Fossette S, Young EJ and Whiting SD (2022) First Assessment of Mercury (Hg) Concentrations in Skin and Carapace of Flatback Turtles (*Natator depressus*) (Garman) From Western Australia. Front. Environ. Sci. 10:843855. doi: 10.3389/fenvs.2022.843855	DBCA	Thevenard Island Eighty Mile Beach

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
Marine megafauna (whale shark, dugong and cetaceans)	Chevron (2019) Soundscape monitoring at JIC site (G1-NT-REPX0000361)	Chevron	Barrow Island
	Chevron (2023) Soundscape Monitoring at the JIC Site 2021-2023	Chevron	Barrow Island
	Raudino HC, Hunt TN, Waples KA (2018) Records of Australian humpback dolphins (*Sousa sahulensis*) from an offshore island group in Western Australia. Marine Biodiversity Records 11:14	DBCA	Montebello Islands
	Raudino HC, Douglas CR, Waples KA (2018) How many dolphins live near a coastal development? Regional Studies in Marine Science 19: 25-32	DBCA	Onslow Area Thevenard Island
	Sprogis K and Parra G (2022) Coastal dolphin and marine megafauna in Exmouth Gulf, Western Australia: informing conservation management actions in an area under increasing human pressure. Wildlife Research, 50(6): 435-450	UWA	Exmouth Gulf
	Wild S, Krutzen M, Rankin M, Hoppitt W, Gerber L, Allen S (2019) Long-term decline in survival and reproduction of dolphins following a marine heatwave. Current Biology 29, R225-R240	University of Leeds	Shark Bay
	Thums M, Ferreira LC, Jenner C, Jenner M, Harris D, Davenport A, Andrews-Goff V, Double M, Moller L, Attard CRM, Bilgmann K, Thomson PG, McCauley R (2022) Pygmy blue whale movement, distribution and important areas in the Eastern Indian Ocean. Global Ecology and Conservation 35 e02054	AIMS	Western Australia
	ECOCEAN Whale Shark Photo-Identification Library	Ecocean	Ningaloo
	AIMS (2021) Individual haplotyping of whale sharks from seawater environmental DNA.	AIMS	Ningaloo
	Lester E, Meekan MG, Barnes P, Raudino H, Rob D, Waples K, Speed CW (2020) Multi-year patterns in scarring, survival and residency of whale sharks in Ningaloo Marine Park, Western Australia. Mar Ecol Prog Ser 634:115-125.	UWA	Ningaloo
	Irvine L and Salgado Kent C (2018) The distribution and relative abundance of marine mega-fauna, with a focus on humpback whales (*Megaptera novaeangliae*), in Exmouth Gulf, Western Australia.	Oceans Blueprint	Exmouth Gulf
	NESP MaC Project 3.10 – A partnership approach to filling key knowledge gaps on dugongs in northern Australia using novel technologies, 2023–2026 (JCU, CDU, DBCA)	AIMS	Exmouth Gulf Ningaloo Shark Bay
	AIMS research on whale sharks	AIMS	Ningaloo
	Sprogis KR, Sutton AL, Jenner MN, McCauley RD, Jenner KCS (2022) Occurrence of cetaceans and seabirds along the Indian Ocean 110 E meridian from temperate to tropical waters. Deep-Sea Research II 205. 105184	Centre for Whale Research/UWA	Indian Ocean 110 E meridian from temperate to tropical waters

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Haughey R, Hunt TN, Hanf D, Passadore C, Baring R and Parra GJ (2021) Distribution and Habitat Preferences of Indo-Pacific Bottlenose Dolphins (*Tursiops aduncus*) Inhabiting Coastal Waters With Mixed Levels of Protection. Front. Mar. Sci. 8:617518. doi: 10.3389/fmars.2021.617518	Flinders University	North West Cape Exmouth Gulf Ningaloo
	Cleguer C, Kelly N, Tyne J, Wieser M, Peel D and Hodgson A (2021) A Novel Method for Using Small Unoccupied Aerial Vehicles to Survey Wildlife Species and Model Their Density Distribution. Front. Mar. Sci. 8:640338. doi: 10.3389/fmars.2021.640338	Murdoch University	Exmouth Gulf
	Sutton AL and Shaw LL (2020) A snapshot of Marine Research in Shark Bay (Gathaagudu): Literature Review and Metadata Collection (1949-2020). West Australian Marine Science Institution, 180.	WAMSI	Shark Bay
	Sutton AL and Shaw JL (2021) Cumulative Pressures on the Distinctive Values of Exmouth Gulf. First draft report to the Department of Water and Environmental Regulation by the Western Australian Marine Science Institution, Perth, Western Australia. 272 pages.	WAMSI	Exmouth Gulf
	Raudino HC, Bouchet PJ, Douglas C, Douglas R, Waples K (2023) Aerial abundance estimates for two sympatric dolphin species at a regional scale using distance sampling and density surface modelling. Front. Ecol. Evol. 10:1086686. doi: 10.3389/fevo.2022.1086686	DBCA	Exmouth Gulf Onslow Area Ashburton Dampier Area Dampier Archipelago Karratha Porth Hedland Area Eighty Mile Beach Southern Pilbara Islands Northern Pilbara Islands Great Sandy Island
	D'Cruz A, Salgado Kent C, Waples K, Brown AM, Marley SA, Thiele D, Yawuru PBC and Raudino HC (2022) Ranging Patterns and Site Fidelity of Snubfin Dolphins in Yawuru Nagulagun/Roebuck Bay, Western Australia. Front. Mar. Sci. 8:758435. doi: 10.3389/fmars.2021.758435	Edith Cowan University	Broome Roebuck Bay
	DBCA (2023), Biodiversity and Conservation Science Annual Report 2022–23, Department of Biodiversity, Conservation and Attractions, Perth.	DBCA	Roebuck Bay

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Lester E, Canon T, Arujo G (2023) Whale sharks (*Rhincodon typus*) feed on baitfish with other predators at Ningaloo Reef. Pacific Conservation Biology 29 86-87	DBCA	Coral Bay Ningaloo
	Palmer C, Martien KK, Raudino H, Robertson KM, Withers A, Withers E, Risk R, Cooper D, D'Cruz E, Jungine E, Barrow D, Cuff N, Lane A, Keynes D, Waples K, Malpartida A and Banks S (2023) Evidence of resident coastal population(s) of false killer whales (*Pseudorca crassidens*) in northern Australian waters. Front. Mar. Sci. 9:1067660. doi: 10.3389/fmars.2022.1067660	Charles Darwin University	Exmouth Gulf Pilbara Coast Islands Southern Pilbara Islands and Coast Eighty Mile Beach Broome Lalang-garram Marine Park Reefs Darwin Harbour Tiwi Islands Groote Archipelago
	Ferreira LC, Thums M, Whiting S, Meekan M, Andrews-Goff V, Attard CRM, Bilgmann K, Davenport A, Double M, Falchi F, Guinea M, Hickey SM, Jenner C, Jenner M, Loewenthal G, McFarlane G, Möller LM, Norman B, Peel L, Pendoley K, Radford B, Reynolds S, Rossendell J, Tucker A, Waayers D, Whittock P, Wilson P and Fossette S (2023) Exposure of marine megafauna to cumulative anthropogenic threats in north-west Australia. Front. Ecol. Evol. 11:1229803. doi: 10.3389/fevo.2023.1229803	AIMS	Shark Bay Ningaloo Coast World Heritage Area Kimberley
	Ningaloo Outlook	CSIRO	Ningaloo Coast World Heritage Area
	Bouchet PJ, Thiele D, Marley SA, Waples K, Weisenberger F, Balanggarra Rangers, Bardi Jawi Rangers, Dambimangari Rangers, Nyamba Buru Yawuru Rangers, Nyul Nyul Rangers, Uunguu rangers, Raudino H (2021) Regional Assessment of the Conservation Status of Snubfin Dolphins (*Orcaella heinsohni*) in the Kimberley Region , Western Australia, Frontiers in Marine Science, 7(January), pp. 1–20.	Universtiy of St Andrews DBCA	Kimberley Roebuck Bay Cygnet Bay Prince Regent River Cambridge Gulf
	Brown AM, Bejder L, Pollock KH, Allen SJ (2016) Site-specific assessments of the abundance of three inshore dolphin species to inform conservation and management, Frontiers in Marine Science, 3(FEB), pp. 1–18.	Murdoch University	Kimberley

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Roebuck Bay Beagle Bay Cygnet Bay Cone Bay Cambridge Gulf Buccaneer Archipelago
	Brown AM, Smith J, Salgado Kent C, Marley S, Allen SJ, Thiele D, Bejder L, Erbe C, Chabanne D (2017) Relative abundance, population genetic structure and acoustic monitoring of Australian snubfin and humpback dolphins in regions within the Kimberley, Report of Project 1.2.4 for the Kimberley Marine Research Program. Western Australian Marine Science Institute, Perth.	Murdoch University	Kimberley Roebuck Bay Cygnet Bay Yampi Sound Prince Regent River Cambridge Gulf Buccaneer Archipelago
	Jarolimek CV, King J J, Apte SC., Hall J, Gautam A, Gillmore M, Doyle C (2023) A review of inorganic contaminants in Australian marine mammals, birds and turtles. Environmental Chemistry 20, 147-170. https://doi.org/10.1071/EN23057	CSIRO	Australia wide
	Lincoln G, Mathews D, Oades D with the Balanggarra, Bardi Jawi, Dambimangari, Karajarri, Mayala, Nyangumarta, Nyul Nyul, Wunambal Gaambera and Yawuru ISWAG members (2021) The Kimberley Indigenous Turtle and Dugong Initiative 2021-2031. Prepared by Mosaic Environmental for the Kimberley Indigenous Saltwater Advisory Group (ISWAG) Broome 2021	Coordinated by the Kimberley Indigenous Saltwater Advisory Group, implemented by Kimberley Saltwater Communities, supported by Western Science Partners	Kimberley
	Bayliss P, Hutton M (2017). Integrating Indigenous knowledge and survey techniques to develop a baseline for dugong (*Dugong dugon*) management in the Kimberley: Final Report of project 1.2.5 of the Kimberley Marine	CSIRO	Kimberley

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Research Program Node of the Western Australian Marine Science Institution, WAMSI, Perth, Western Australia, 98 pp.		
	Bayliss P, Raudino H, Hutton M, Murray K, Waples K and Strydom S (2019) Modelling the spatial relationship between dugong (*Dugong dugon*) and their seagrass habitat in Shark Bay Marine Park before and after the marine heatwave of 2010/11. Department of Agriculture, Water and the Environment Final Report 2.	CSIRO DBCA	Shark Bay Ningaloo Reef Exmouth Gulf
	Raudino H, D'Cruz E, Waples K, Menzies J, Murdoch J, Quartermaine T and Mathews D (2020) Dry season dreaming Snubfin census on Yawuru sea country. Landscope 36, 41-44	DBCA	Roebuck Bay
	Thums M, Jenner C, Waples K, Salgado Kent C and Meekan M (2018) Humpback whale use of the Kimberley; understanding and monitoring spatial distribution. Report of Proposal 1.2.1 prepared for the Kimberley Marine Research Program, Western Australian Marine Science Institution, Perth, Western Australia, 78pp. Tourism WA. Shire of Broome visitor factsheet. Three-year average 2015/2016/2017. Produced by Tourism WA – Strategy and Research.	AIMS WAMSI	Kimberley
Seabirds and shorebirds	Chevron Env-Gor-Seabird Monitoring Report 2021/22 J01209 (ABU220500068)	Chevron	Ah Chong Island (Montebello group) Double Island North Double Island South Parakeelya Island Barrow Island Group
	Dunlop JN. and Greenwell C (2021) Seasonal movements and metapopulation structure of the Australian fairy tern in Western Australia. Pacific Conservation Biology, 27, 47-60	Conservation Council of Western Australia	Stewart Island Fortescue Island Mardie Island Regnard Island Scholl Island Shark Bay Exmouth Gulf Somerville Island Tent Island Hope Point

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
			Houtman Abrolhos Islands Ningaloo Coast
	Weller D, Kidd L, Lee C, Klose S, Jaensch R, Driessen J (2020) Directory of Important Habitat for Migratory Shorebirds in Australia. Prepared for Australian Government Department of Agriculture, Water and the Environment by BirdLife Australia, Melbourne	Birdlife Australia	Barrow Island Carnarvon Coral Bay Exmouth Gulf Houtman Abrolhos Islands Karratha Ningaloo Onslow Area Port Hedland Adele Island Lacepede Islands Dampier Peninsula
	Australia's National Shorebird Monitoring Program https://awsg.org.au/about-us/shorebirds-2020/	Birdlife Australia	Dampier Port Hedland Shark Bay Eighty Mile Beach Barrow Island Exmouth Gulf Ningaloo Reef Ningaloo Roebuck Bay
	Birdata: https://birdata.birdlife.org.au/	Birdlife Australia	Western Australia
	eBird: https://ebird.org/hotspots?hs=L5713406&yr=all&m=	eBird	Western Australia
	Astron (2020) Thevenard Island Retirement Project Terrestrial Ecological Monitoring Report June 2020. Prepared for Chevron	Chevron	Thevenard Island

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Biota (2022) Ashburton Salt Project Migratory Shorebird Assessment. Prepared for K + S Salt Australia	for K + S Salt Australia	Ashburton Exmouth Gulf
	Cannell B, Hamilton S, Driessen J (2019) Wedge- tailed shearwater foraging behaviour in the Exmouth region. Report for Woodside Energy Ltd. University of Western Australia and Birdlife Australia.	UWA	Muiron Islands
	Sutton AL and Shaw LL (2020) A snapshot of Marine Research in Shark Bay (Gathaagudu): Literature Review and Metadata Collection (1949-2020). West Australian Marine Science Institution, 180.	WAMSI	Shark Bay
	Sutton AL and Shaw JL (2021) Cumulative Pressures on the Distinctive Values of Exmouth Gulf. First draft report to the Department of Water and Environmental Regulation by the Western Australian Marine Science Institution, Perth, Western Australia. 272 pages.	WAMSI	Exmouth Gulf
	Woodside Case Study: Ningaloo Region Migratory Shorebirds of Exmouth Gulf (Birdlife)	Woodside Birdlife Australia	Exmouth Gulf Giralia Station
	DBCA shorebird surveys of Montebello Islands and Bedout Island in 2017 and 2018 mentioned in: Australian National Report to the 19th JAMBA, 13th CAMBA and 6th ROKAMBA Consultative Meetings, Commonwealth of Australia 2018	DBCA	Bedout Island Montebello Islands
	Roger DI, Scroggie MP, Hassell CJ (2020) Review of long-term shorebird monitoring in north Western Australia. Arthur Rylah Institute for Environmental Research. Technical Report Series No. 313. Prepared for DBCA	Arthur Rylah Institute DBCA	Roebuck Bay Eighty Mile Beach Bush Point
	Pendoley Environmental (2021) Varanus and Airlie Islands Shearwater Monitoring Annual Report 2020	Santos	Lowendal Islands Group Airlie Island Serrurier Island
	Bancroft W and Bamford M (2018) ANSIA Stage 2 Fauna Assessment	MJ and AR Bamford Consulting Ecologists	Pilbara
	Phoenix Environmental Sciences (2023) Long-term migratory shorebird monitoring program for the Optimised Mardie Project. Prepared for Mardie Minerals Pty Ltd	Phoenix Consultants	Mardie
	Lavers JL, Humphreys-Williams E, Crameri NJ, Bond AL (2020) Trace element concentrations feathers from three seabird species breeding in the Timor Sea. Marine Pollution Bulletin 151. 110876	University of Tasmania	Bedout Island

Receptor	Existing baseline monitoring	Source / Data Custodian	Spatial extent
	Biota Environmental Sciences (2019) Asian Renewable Energy Hub Environmental Review Document, Assessment Number 2140, Appendix 8, Asian Renewable Energy Hub Migratory Shorebirds and Waterbirds Survey. Prepared by Biotat Environmental Sciences, Nov 2018	Biota Environmental Sciences for Asian Renewable Hub (NW Interconnected Power)	Eighty Mile Beach
	Chan YC, Chan DTC, Tibbitts TL, Hassell CJ, Piersma T (2023) Site fidelity of migratory shorebirds facing habitat deterioration: insights from satellite tracking and mark-resighting. Mov Ecol 11, 79 https://doi.org/10.1186/s40462-023-00443-9	Department of Coastal Systems, NIOZ Royal Netherlands Institute for Sea Research Global Flyway Network Australasian Wader Studies Group	Roebuck Bay Eighty Mile Beach

Appendix C: OSM services provider call out order form

Operational and Scientific Monitoring (OSM) Services Call-Off Order Form

Please do not hesitate in contacting the Duty Manager at the earliest opportunity in the event of an incident or potential incident. Please ensure you telephone the Duty Manager before e-mailing or faxing this completed form

Oil Spill Response Limited's safety policy requires us to work closely with the mobilising party to ensure all aspects of safety and security are addressed for our personnel.

To	Duty Manager
OSRL Base	Southampton, UK Loyang, Singapore Fort Lauderdale, USA
Telephone	+65 6266 1566
Emergency Fax	+65 6266 2312
Email	dutymanagers@oilspillresponse.com, osm@oilspillresponse.com

Details of Authorised Contact				
Mobilising Company				
Name of Person Authorising OSRL				
Position of Authorising Representative				
Direct Phone Number	Country Code	+	Number	
Email Address				

Operational Monitoring service to be activated (X)		**Scientific Monitoring service to be activated (X)**	
OM1 Hydrocarbon Properties and Weathering Behaviour at Sea		**SM1** Water Quality Impact Assessment	
OM2 Water Quality Assessment		**SM2** Sediment Quality Impact Assessment	
OM3 Sediment Quality Assessment		**SM3** Intertidal and Coastal Habitat Assessment	
OM4a Surface Chemical Dispersant Effectiveness and Fate Assessment		**SM4** Seabirds and Shorebirds	
OM4b Subsea Dispersant Injection Monitoring		**SM5** Marine Mega-fauna Assessment	
OM5 Marine Fauna Surveillance		**SM6** Benthic Habitat Assessment	
OM6 Shoreline Clean-up Assessment		**SM7** Marine Fish and Elasmobranch Assemblages Assessment	
		SM8 Fisheries Impact Assessment	
		SM9 Heritage Features Assessment	
		SM10 Social Impact Assessment	

Location of Port of Staging/ Departure – Port (X)		Additional Information
Ashburton		
Barrow Island		
Broome		
Cape Preston		
Dampier		
Darwin		
Derby		
Exmouth		
Onslow		
Port Hedland		
Port Walcott		
Varanus Island		
Wyndham		
Yampi Sound		
Others (*To be Agreed)		

Location of Port of Staging/ Departure – Airport (X)		Additional Information
Barrow Island		
Broome		
Cape Preston		
Darwin		
Derby		
Karratha		
Learmonth		
Lombardina		
Onslow		
Pardoo		
Perth		
Port Hedland		
Roebourne		
Wallal Downs		
Others (*To be Agreed)		

Request for OSM position to IMT/EMT (X)		IMT/EMT Address
OSM Implementation Lead		
OSM Field Operations Manager		
SM Coordinator		
OM Coordinator		

Invoice Address if available	
Purchase Order Number	

I, the above-named Authorising Representative for the Mobilising Company, approve activation of Oil Spill Response Limited and its resources for OSM Services under the terms of the SUPPLEMENTARY SERVICE AGREEMENT FOR OPERATIONAL AND SCIENTIFIC MONITORING (OSM) SERVICES Agreement in place between the above stated Company and Oil Spill Response PTY Limited.

Signature:		Date / Time (UTC+8):		

Please telephone the Duty Manager to confirm receipt the completed form after sending this completed form.

Appendix C
Exercise Documentation

Australian Institute for Disaster Resilience

COMPANION DOCUMENT

AUSTRALIAN DISASTER RESILIENCE HANDBOOK COLLECTION

Managing Exercises Companion Templates

Companion to Managing Exercises (AIDR 2023)

APPENDIX 1 – CONCEPT DEVELOPMENT MEETING TEMPLATE

Agenda

Aim:

To discuss, agree on and further develop the broad exercise concept and key parameters including aim, objectives, evaluation concept, core dates, exercise localities, resources, and participants.

Inputs:

Higher level guidance; risk assessments and forecasts; recommendations from lessons, reviews, research and inquiries; handbooks and guides, regulatory requirements, outcomes from any prior scoping activities and inputs from stakeholder engagement.

Outcomes:

General agreement and sufficient guidance to develop the exercise concept document. Meeting minutes and briefings as required.

Agenda:

1. Governance Arrangements
2. Need and Purpose of the exercise
3. Aim of the exercise
4. Objectives for the exercise
5. Level and method of community engagement
6. Participating organisations and level of participation
7. Location, planning milestones, key events, and related activities
8. Planning limitations and risk assessment including consideration of local issues, concerns and sensitivities
9. Evaluation approach
10. Resource requirements and preliminary budget
11. Action plan (plan of actions required to develop and finalise the exercise concept document)

APPENDIX 2 – INITIAL PLANNING MEETING TEMPLATE

Agenda

Aim:

To agree on and refine the exercise parameters as presented in the exercise concept document.

Inputs:

Exercise concept document, stakeholder engagement.

Outcomes:

Broad agreement on the exercise parameters and sufficient guidance to refine the exercise plan before final endorsement.

Agenda:

1. Business arising from the concept development meeting
2. Review exercise context
3. Review exercise concept
4. Refine objectives and identify standards/measures
5. Select exercise style and technologies
6. Determine dates, duration and location(s) of exercise-related activities
7. Determine aim and objectives for each activity
8. Determine management arrangements for each activity
9. For each exercise-related activity, determine participation to prepare relevant invitations to attend
10. Determine EXCON arrangements and determine staffing requirements for:
    a. exercise control team (EXCON)
11. Determine logistical requirements and identify team members for:
    a. logistics team
    b. administration and support
12. Determine public relations and media requirements and identify team members for:
    a. public relations and media team
13. Determine exercise evaluation requirements and identify team members for: a. exercise evaluation team
14. Determine exercise writing requirements and identify team members for: a. exercise writing team(s)
15. Determine actions and allocate responsibilities

(Agenda may need to be tailored to suit multiple activity and single exercise programs)

APPENDIX 3 – MID PLANNING MEETING TEMPLATE

Agenda

Aim:

Refine exercise management arrangements and review the status of exercise planning including major issues.

At the conclusion of the mid planning meeting those appointed to the various exercise management teams should have sufficient detail to initiate their respective activities.

Inputs:

- Endorsed exercise concept document
- Exercise plan
- Activities list
- Activity summary sheet(s)
- Draft activity (or exercise) instructions
- Draft scenario documents

Outcomes:

Broad agreement on exercise management plans and sufficient guidance to refine the exercise instruction(s) before endorsement.

Confirmation of exercise scenario and agreed master schedule of events.

Agenda:

1. Business arising from the initial planning meeting
2. Review any further development to the exercise concept
3. Confirm exercise objectives and standards/measures
4. Confirmation of scenario detail and documentation requirements
5. Review EXCON arrangements, including:
    a. EXCON structure and appointments
    b. facilitators
    c. public relations and media
    d. visitor and observer arrangements
6. Further develop logistical and administration requirements
7. Determine actions to be achieved before the final planning meeting and allocate responsibilities
8. Action plan (plan of actions required to develop and finalise the exercise concept document)

(Agenda may need to be tailored to suit multiple activity and single exercise programs)

APPENDIX 4 – FINAL PLANNING MEETING TEMPLATE

Agenda

Aim:

Review all exercise planning and confirm that planning is complete.

Inputs:

- Activity (and/or Exercise) Instructions
- Scenario documents

Outcomes:

Identify and resolve any outstanding issues.

Agenda:

1. Confirm key exercise management arrangements, including revised or additional matters
2. Confirm timing of remaining key milestones and/or activities
3. Validate the exercise scenario and associated documentation
4. Identify and resolve outstanding issues

(Agenda may need to be tailored to suit multiple activity and single exercise programs)

APPENDIX 5 – POST EXERCISE MEETING TEMPLATE

Agenda

Aim:

Finalise the exercise program and related reports.

Inputs:

- Facilitator(s) checklists and exercise notes
- Exercise debrief notes
- Draft exercise report

Outcomes:

- Finalised exercise report
- Recommendations for future exercise programs
- Identified arrangements for implementing recommendations

Agenda:

1. Review exercise planning:
    a. concept development
    b. detailed planning
    c. conduct
    d. post-exercise
2. Review exercise report
3. Process for dissemination of exercise report
4. Recommendations for future activities
5. Arrangements for implementation of recommendations

(Agenda may need to be tailored to suit multiple activity and single exercise programs)

APPENDIX 6 – EXERCISE CONCEPT DOCUMENT TEMPLATE

Exercise Insert Name Concept document

Need

Summary of the need to conduct this exercise.

Overview

Short paragraph, what this exercise is to achieve. What is the target audience?

Aim

One sentence.

Exercise objectives

Exercise scope

What is included; what is excluded?

Exercise outline

Type, styles, phases etc. No need for scenario at this point. Could include theme that is proposed to use to meet the objectives

Governance and management structure

Exercise director(s)

Organisation chart and appointments for planning phase and outline for conduct phase.

Participating organisations

Public information

Strategic direction and responsibility for real and pseudo media What is the public message, if any?

Evaluation

Focus areas/approach?

Budget

Timeline

Point of contact

Approval / by / date

APPENDIX 7 – EXERCISE PLAN TEMPLATE

The purpose of the exercise plan is to outline the method (with the exercise planning team's agreement) by which the exercise will be designed, conducted and evaluated. Suggested content for the exercise plan includes:

SECTION	HEADINGS
Introduction	Background Aim of the exercise Objectives Standards / measures Scope References Participants Roles and responsibilities
Exercise Format	Exercise name Exercise type Scenario (outline only)
Governance	Exercise planning team organisational structure
Program of Activities	Activities (including meetings, briefings, workshops, training etc.) Timings Locations
Exercise Control	Exercise control (EXCON) staff (appointments and responsibilities) Briefings Documentation Communication Safety and security Media and visitors Exercise termination (and exit strategy)
Exercise Evaluation	Purpose of evaluation Process of evaluation Exercise debriefs Exercise reporting
Administration	Costs/budget Logistical requirements Travel and accommodation Catering
Attachments	Exercise outputs Exercise program or timetable EXCON staff (responsibilities) Exercise briefings (rationale and content) Exercise facilities (diagrams and equipment details) Roles and responsibilities (checklist)

APPENDIX 8 – PARTICIPANT HANDBOOK TEMPLATE

Exercise Insert Name

Introduction

- Handling instructions (security classification)

Background information

- Overview
- Aim
- Exercise objectives
- Exercise format
- Exercise context
- Exercise assumptions
    - In-exercise/out-of-exercise areas
    - No-go zones
- Participant guidance
- Cultural and sensitive issues

Situation

- General idea
- Technical briefs/detail
- Maps

Command and control

- EXCON
    - Facilitators
    - Evaluators
    - Points of contact
- Participant command, control and coordination
    - What levels are playing
    - How to interact with EXCON
    - Refer to exercise contact directory

Administration and logistics

- Exercise dates and locations
- Travel arrangements
- Accommodation
- Climate conditions
- Dress code
- Entry and security procedures
- Catering
- Communication
- Points of contact
- Expenses
    - Incurring/approval of expenditure
    - Allowances and claims
- Safety instructions
    - Risk
- Psychological safety

Participating organisations

Pre-exercise activity

- Pre-exercise training
- Briefings
- Activity schedule

Post-exercise activity

- Debriefings
- Evaluation

Attachment – if required

- Communication instructions
- Timeline
- Contact directory
- Risk assessment or summary if applicable
- EXCON

APPENDIX 9 – EXERCISE CONTROL INSTRUCTION TEMPLATE

Exercise Insert Name

Exercise control

- EXCON team members (appointments and responsibilities)
- EXCON facilities
- Exercise briefings
- Time zones
- Communication
- Media, observers and visitors
- Exercise termination (and exit strategy)
- Exercise facilities (diagrams and equipment details)

APPENDIX 10 – MASTER SCHEULDE OF EVENTS TEMPLATE

The master schedule of events provides a detailed list of all activities and actions that need to occur for the exercise objectives to be achieved and key performance indicators met. Two examples of detail that could be included in the schedule are provided.

Exercise inputs, Day #					
Serial	From	To	Time	Input, action or activity	Comment

APPENDIX 11 – MASTER SCHEDULE OF EVENTS TEMPLATE

EXERCISE (Insert Name)

Serial	Day	Date	Time	Location	Event	Live or Notional	Desired Outcome	Control Docs	Resources	Responsible	Completed
ADMINISTRATION AND LOGISTICS											
EXERCISE PHASE											
					Commencement of Exercise		Exercise Start				
					ENDEX		ENDEX				
ADMINISTRATION AND LOGISTICS											

APPENDIX 12 – EXERCISE INPUT TEMPLATE

Exercise Insert Name

INCIDENT/INFORMATION INPUT

Message number:

Date/time of inject:

Time injected:

Injection means:

Phone/fax/email/other from:

To:

Message:

Insert enough detail to allow the person inputting the message to field any immediate enquiries that may come from the input

Attachments:

Insert details of attachments that accompany this input

Instructions:

Insert enough detail for helping an exercise controller, facilitator, or evaluator to follow-up on this input, if required

APPENDIX 13 – CONTROL DOCUMENT TEMPLATE

CONTROL DOCUMENT #1

Exercise Insert Name

EXERCISE MATERIAL ONLY

EXERCISE MATERIAL ENDS

APPENDIX 14 – EXERCISE EVALUATION PLAN TEMPLATE

Exercise evaluation plan Insert Exercise Name

Introduction
Include a discussion (if relevant) of the:

- background to the exercise to be evaluated (including name and dates of the proposed activity and areas of the activity to be evaluated)
- the consequent need for evaluation (i.e., the problem(s) or issue(s) that require resolution or a decision)
- what has led to the evaluation being conducted (e.g. identified gap, previous exercise outcomes etc.)
- what areas of the activity will be evaluated?
- brief overview of what the evaluation report will cover.
- other relevant background information as appropriate.

Use of the evaluation
How will the information produced from the evaluation be used? What decisions will be influenced by the evaluation and who will make those decisions? OR What issues will be clarified?

Management of the evaluation
Responsible body: The body which is approving the activity being evaluated and will receive the

report. Identify responsible body and outline role and responsibilities. This will normally be the exercise management or planning team.

Evaluation coordinator: The person who plans the evaluation and manages the evaluation on a day-to-day basis. Identify evaluation coordinator and outline role and responsibilities.

Evaluators: The other people who will be conducting the evaluation, under the direction of the evaluation coordinator. Identify evaluators (if possible) and outline roles and responsibilities.

Aim of the evaluation
What is the overall aim or intent of the evaluation (as opposed to the aim of the exercise – may be the same or different)? What information will be collected and what will be learned?

Parameters of the evaluation
The following matters are IN scope:

The following matters are OUT of scope:

Key question(s)
Note: in the evaluation of an exercise the key questions will generally be the exercise objectives, rephrased as questions.

What question(s) is the evaluation is trying to answer? May require more than one question, but there should be no more than three to five key questions.

Answers to the key question(s) will form the body of the evaluation report.

Sub-questions
Only include if necessary – may not be required in the evaluation of minor activities.

For each key evaluation question, identify sub-questions that will generate information to describe or measure specific aspects of the key question. Taken together, answers to the sub-questions should answer that key question.

Note: in the evaluation of an exercise these will closely reflect sub-objectives but will be phrased as questions.

Methods
This section is used to identify the methods (data collection and analysis) that will be used to answer the sub-questions.

8.a Data collection
Outline the methods and arrangements for collecting data.

Often useful to attach a matrix showing which methods will be applied to answer each sub-question.

Where necessary, include arrangements and timetable for the following:

- distribution of material (questionnaires/surveys, data collection templates etc.)
- appointments for interviews
- equipment requirements
- validation processes.

8.b Analysis

Outline the methods and arrangements for analysing the data. Where necessary, include the following:

- who will conduct the analysis (including possible use of external people if applicable)
- how the analysis will be conducted (e.g. collating and reviewing evaluator reports to identify capability gaps)
- resource requirements.

Quality control

Outline the process for overall quality control. Possible mechanisms include:

- regular debriefs with users during data collection and analysis.
- workshops/conferences to review data and its interpretation.
- agreed criteria for terms such as 'timely', 'appropriate', 'efficient' or 'successful'.
- cross-checking evidence, findings, and recommendations.

Note: what quality control mechanisms are appropriate will depend on what is feasible and sufficient.

Security, safety, and ethics

Outline of the arrangements for managing security, safety and ethical issues that relate to the evaluation.

Key risks/mitigation strategy

At a minimum, briefly discuss what could go wrong (in the evaluation not the exercise) and what steps will be taken to mitigate. Only include a detailed risk assessment (including risk matrix) if necessary.

Communication strategy

Outline a communication strategy for the evaluation. Include details of any briefings or workshops to develop recommendations.

Evaluation preparation

Training requirements

Briefing requirements

Awareness of jurisdiction or organisation legislation, arrangements, policy, plans, SOPs

Report

Identify a distribution list for both the draft and final reports.

Resources

Budget/administrative

Guidance (e.g. policy and templates) Evaluators

Timeframe

- Evaluation plan by
- Fieldwork between
- Analysis between
- Draft report by
- Final report by

Attachment [*] – Evaluator Requirements

Attachment [*] – Key contacts for evaluators and mentors

Attachment [*] – Evaluator aide memoire

Attachment [*] – Exercise evaluator briefing - content Appendix *: Evaluator data collection plan

Appendix *: Evaluator report template

APPENDIX 15 – EVALUATOR AIDE MEMOIRE TEMPLATE

Attachment [*] to evaluation plan Evaluator aide memoire

The following evaluation checklist describes the evaluator's responsibilities before, during and after the exercise.

Before the exercise:

- Review the exercise plan, scenario, master schedule of events, evaluation sub-plan, safety/

risk instructions and other exercise documents, with special emphasis on the objectives, standards and key issues identified to facilitate data collection.

- Complete evaluator training/briefing requirements.
- Familiarise yourself with the legislation, plans, policies, procedures, and processes applicable to your assigned location/jurisdiction/organisation/capability.
- Familiarise yourself with the exercise communications and IT systems and tools.
- Identify and review the templates you may be required to fill out.
- Attend the EXCON and evaluator briefing at your assigned location.

On arrival at start of shift:

- Check in with the evaluation coordinator.
- Receive a shift change brief from the outgoing evaluator if applicable.
- Check in with exercise participants to advise you are on site (incident controller or similar).

During the exercise:

- Observe the exercise and record your observations.
- Identify schedule for and attend evaluator briefings/ conferences/teleconferences.
- Identify schedule for and attend key operational briefings/conferences/ teleconferences and other key events as per your collection plan.
- You may need to interview participants to clarify events and gain insight into decisions and actions.
- Collect supplementary data, which may include the following:
  - situation reports, intelligence summaries, briefings, debriefings
  - logs/running sheets (e.g. communications log, daily log)
  - requests for Information (RFI) and RFI logs
  - media releases
  - technical data products (e.g. GIS products, maps, plume model results)
  - incident action plans and other planning documents
  - quantitative data (times, numbers, equipment, resources).

Be sure to note the date and time of each piece of supplementary information along with your location (reference points) so it can be related back to the relevant part of the exercise.

- Collect participant feedback forms, where used, for those personnel whose exercise involvement is completed.

During downtime, after your shift or after ENDEX:

- Progress the completion of the applicable templates.

At the end of shift:

- Conduct a shift change brief with your replacement.
- Contact the evaluation coordinator at EXCON to advise your status.

After ENDEX:

- Attend and document relevant debriefs.
- Participate in the EXCON debriefs.
- Collect any remaining participant feedback forms.
- Complete exercise report.
- Forward your completed report to the evaluation coordinator by the agreed date

APPENDIX 15 – EVALUATOR AIDE MEMOIRE TEMPLATE

Attachment [*] to evaluation plan Exercise evaluator briefings

PART A

Evaluator specific briefing(s)

1. General overview of exercise
2. Exercise aim
3. Exercise objectives
    a. What is the jurisdiction/organisation trying to get out of the exercise?
    b. What are the key focus areas (strategic/ operational/tactical)
    c. What should evaluators be focusing on or not?
    d. What is being tested?
    e. Last-minute changes
4. Scope of exercise
5. Exercise parameters
    a. Organisations participating and their role.
    b. Organisations not participating.
    c. Notional organisation involvement
    d. Notional elements/exercise management artificiality
    e. Relevant exercise history/exercise manager's rationale for why particular aspects/activities are included (or not included)
    f. Any previously identified issues/lessons learned that are being revisited
6. Jurisdiction/organisation arrangements/current issues
    a. Environment: organisational, jurisdictional, political
7. Scenario
    a. Master schedule
    b. Critical scenario developments/key timings
    c. Key events relevant to evaluators
8. Exercise management structure
    a. Key timings
    b. Briefings/meetings
    c. Evaluator brief/debrief times.
9. Evaluator administration
    a. General instructions
    b. Administration details
    c. Meals
    d. Accommodation
    e. Security/access
    f. Transport/hire cars
    g. Identification/tabards
    h. Questions

PART B

Organisation/capability-specific briefing/discussions

1. Evaluators to visit/meet with the relevant organisation/ capability area to discuss specific details
2. Detail of organisation/capability objectives
3. Critical scenario developments/key timings for that organisation/capability
4. Focus areas
5. Discuss/agree evaluator role

PART C

General exercise briefings that evaluators need to attend

1. Safety
2. Risk assessment/management
3. Communications
4. Logistics
5. Media
6. Site visits
7. Other relevant meetings/briefings
8. Role player briefings
9. Debrief(s)

APPENDIX 17 – EVALUATOR DATA COLLECTION TEMPLATE

Evaluator data collection plan templates

Option A:

(Exercise name) evaluator data collection plan

Name of organisation/capability or function: (organisation/capability name)

Date and time	MSE line item number	Objective	Relevant measure/ standard	Observation location

Option 8:

(Exercise name) evaluator data collection plan

Name of organisation/capability or function: (organisation/capability name)

Objective 1:				
Measures and standards:	MSE item	Time	Location	Description
Objective 2:				
Measures and standards:	MSE item	Time	Location	Description
Objective 3:				
Measures and standards:	MSE item	Time	Location	Description

APPENDIX 18 – EVALUATOR REPORT TEMPLATE

(ORGANISATION/CAPABILITY) evaluator report

Exercise Insert Name

Author(s): include title, given and surnames, post-nominals, organisation and position within organisation

Executive summary

A maximum of one page that covers the following key things:

1. A short paragraph introducing the exercise in terms of:
   - time, date, place, participants, exercise type and budget
   - aim of exercise
2. What was being evaluated
3. A comment on the overall success or not of the capability(ies) as part of the exercise
4. List issues identified and treatment options (or summarise if there are numerous)

Note: The executive summary should only be written once you have completed your analysis and summary of evidence.

Summary of evidence

For each objective, put your analysed data into these tables against each relevant objective.

Objective 1:	Write each objective into one of these boxes
OBSERVATIONS	
What worked well and why? What went well? What worked? Why did it go well/work? What was good about it?	
What didn't work well and why?(categorise each point by P^2OST^2E) What didn't work? Why didn't these things work? What effect did this have?	
ISSUE(S)	
What are the issues arising from your analysis of your observations?	
TREATMENT OPTION(S)	
What are the potential treatment options (if any) for the issues you have identified?	
Was the objective achieved: yes no partially? Was the objective achieved overall? – may be any of these three options.	
Why/why no? A summary of why you have concluded that the objective was/was not/was partially achieved…	

Any other comments

Discuss any other important issues that were observed during the exercise and how they affected the achievement of exercise objectives.

<<Signature block>>

APPENDIX 19 – P2OST2E ELEMENTS OF CAPABILITY TEMPLATE

Each of these elements is present in all capabilities and breaking down issues into their basic P2OST2E elements can help to identify root causes for problems, as well as viable treatment options. This is an important aspect of the resolution stage of any activity because the causes of problems (rather than the observable symptoms) must be addressed so that these problems may be remedied for future activities.

People	Roles, responsibilities, accountabilities, skills
Process	Plans, policies, procedures, processes
Organisation	Structure, jurisdiction
Support	Infrastructure, facilities, maintenance
Technology	Equipment, systems, standards, security, inter-operability
Training	Capability qualifications/skill levels, identification of required courses
Exercise management	Exercise development, structure, management, conduct

APPENDIX 20 – EXAMPLE EVALUATION QUESTIONS TEMPLATE

There are two types of questions drawn from previous activities shown here:

1. Exercise management evaluation questions
2. Performance evaluation questions

1. Exercise management evaluation

For the evaluation of a multi-organisation exercise, the following questions and sub questions have been used.

a. Does the exercise format allow the achievement of objectives?

   a1. Does the format of the exercise provide value given the resources allocated to it?

   a2. Did the level of involvement from organisations support the focus of the exercise?

   a3. Did the pre-deployment discussion exercise contribute to achieving the exercise objectives? (If applicable)

b. Assess the planning process for this exercise.
   b1. Was the length of planning time appropriate?

   b2. Were the number, sequence, and nature of meetings appropriate?

   b3. Was the governance structure appropriate?

   b4. Were appropriate tools and systems in place to support the planning process?

   b5. Was there consistent situational awareness across all exercise functions?

   b6. Was there a process for monitoring ongoing changes that affected the exercise?

   b7. Was the objective-setting process appropriate and did they contribute to the focus areas?

c. Evaluate the reporting process for this exercise.

   c1. Was the reporting timeline appropriate and was it adhered to?

   c2. Did the reporting process facilitate the analysis of organisation reports and their contribution to the objectives?

Exercise management evaluations may also include the evaluation of exercise control, and the following types of questions are commonly used.

a. Evaluate exercise control command, management and coordination functions, with a focus on structure, EXCON team members and shift requirements.
b. Evaluate the information and communications technology required to support exercise control operations – include use of technology (i.e., computers, phones, data projectors, display boards) and the display of key information (e.g. master log)
c. Evaluate the physical facilities required to support exercise control – space for main control room and additional meeting/briefing rooms, layout, support, catering, security etc
d. Evaluate the requirements to manage exercise control forward – numbers & locations, command/control/ communication requirements (e.g. management from EXCON and within the Forward area, coordination of exercise play against the Master Schedule).

2. Performance evaluation questions

Below are sample questions used in the evaluation of capabilities during previous exercises. Some of the more complex evaluation questions have a series of sub questions associated with them.

a. Evaluate the effectiveness of the establishment of first responder command, control and coordination arrangements.

b. Examine the Country Fire Authority (CFA)'s capability to deploy hazmat resources and combat a hazmat incident on a large scale.

   b1. Was the logistical management of hazmat resources appropriate?

   b2. What is the ability of the CFA to maintain a long-term commitment to a large-scale hazmat event?

   b3. Was the inter-service deployment of hazmat and chemical, biological and radiological (CBR) resources appropriate?

   b4. Was the interstate deployment of hazmat and CBR resources appropriate?

   b5. Is there interoperability in the fire service technical hazmat equipment?

c. Was procedural guidance for the management and operation of the State Operations Centre (SOC) and Regional Operations Centre (ROC) capabilities provided?

   c1. Did participants ensure that the incident was managed in accordance with the Australian Interagency Incident Management System (AIIMS)?

   c2. Did participants ensure that the appropriate incident descriptor was implemented?

   c3. Did participants ensure that the SOC maintained an overview of operations resources and response capability?

   c4. Did participants ensure that the SOC was activated and manned in a timely manner?

   c5. Did participants ensure the activation of the ROC for immediate operation in support of any type of emergency (ref: ROC, pg. 14)?

   c6. Did participants ensure that operational preparedness levels were reviewed?

d. What is the CFA's ability and capacity to apply Victoria's emergency management arrangements, with a particular focus on command and control?

   d1. What is the CFA's role in Victorian State Emergency Management Plan?

   d2. Were command and control arrangements implemented and adhered to?

e. Assess the command, control and coordination of emergency organisations at a building collapse incident.

   e1. Did the Forward Command Post personnel demonstrate a good knowledge of the roles and responsibilities of the organisations and work together in a cooperative and collaborative manner?

   e2. Was there effective information flow between the Forward Command Post and the Taskforce Leader?

   e3. Were detailed briefings provided by the Taskforce Leader to the Taskforce on the objectives, strategies and tactics?

APPENDIX 21 – EXERCISE REPORT TEMPLATE

Suggested list of contents:

SECTION	HEADINGS
INTRODUCTION	(Introduces the exercise in the form of an executive summary)
BACKGROUND	• Background to the exercise • Exercise management • Exercise aim • Expected exercise objectives • Exercise scope • Participating organisations
EVALUATION REPORT	• Structure of the report • Commentary (for each outcome) – Objective – Rationale for objective – Observations – Recommendations
CONCLUSIONS	(Summary of the key findings and evaluator's comments)
ATTACHMENTS	• Consolidated list of recommendations • Glossary of terminology and acronyms • Exercise diagrams

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Appendix D
Oil Spill Trajectory Modelling Summary

MAQ0852J VERMILION WANDOO B16 OIL SPILL MODELLING (REV 3; JULY 2024)

EXECUTIVE SUMMARY

Vermilion Oil and Gas Australia Pty Ltd (VOGA) is the operator of the Wandoo production platform, located approximately 70 km northwest from Dampier, Western Australia in a water depth of approximately 50 m.

As part of preparing the oil pollution emergency plan (OPEP) for the B16 well drilling campaign, a detailed oil spill modelling study was commissioned. The study assessed the exposure from a 25,555 m^3 (or 160,735 bbl) surface release of Wandoo crude over 43 days, to represent an unrestricted loss of well control (unmitigated case).

In addition, the study examined the potential benefit of applying surface dispersant as a mitigation measure (referred to as the mitigated case).

The potential risk of exposure to the surrounding waters and contact to shorelines was assessed for three distinct seasons; (i) summer (October to February), (ii) the transitional periods (March, August and September) and (iii) winter (April to July). This approach assists with identifying the environmental values and sensitivities that would be at risk of exposure on a seasonal basis.

Methodology

The modelling study was carried out in several stages. Firstly, a ten-year hind-cast current dataset (2009 to 2018) that included the combined influence of large-scale ocean circulation and tidal currents was developed. Secondly, the currents, spatial winds and then detailed hydrocarbon properties were used as inputs in the three-dimensional oil spill model (SIMAP) to simulate the movement, spreading, entrainment, weathering and fate of the spilled hydrocarbons over time.

As spills can occur during any set of wind and current conditions, the modelling was conducted using a stochastic (or probabilistic) approach, which involved running 100 spill simulations per season (summer, transitional and winter) using the same release information (i.e. spill volume, duration and oil composition), though different start times. This ensured that each simulation was exposed to different wind and current conditions and, in turn, movement and weathering of the oil. Once all 100 simulations (per season) were run, the model combined the results to determine the risk and potential exposure/contact to the surrounding waters and shorelines and specific sensitive resources over each seasonal period.

The 100 simulations per season were remodelled under identical conditions, with surface dispersant applied to oil within a 40 km by 40 km zone centred on the release location. A dispersant to oil ratio of 1:20 and effectiveness of 50% was assumed for 10 hours during daylight, starting from 48 hours after the initial release.

In addition to the stochastic modelling, the "worst case" deterministic runs were identified for the scenario based on the following criteria for spill response (a to d) and Operational and Scientific Monitoring (OSM) Bridging Implementation Plan (BIP, e) capability requirements;

a. largest volume of oil ashore;

b. longest length of shoreline contacted above 100 g/m^2 (actionable shoreline oil);

c. minimum time before shoreline contact above 10 g/m^2;

d. largest swept area of oil on the sea surface above 10 g/m^2 (actionable sea surface oil); and

e. maximum number of receptors with shoreline contact above 10 g/m^2 in 7 days for the unmitigated case.

The deterministic simulations (a–d) are presented as a side by side with and without surface dispersant.

Oil Properties

Wandoo Crude (API 19.4) was used for this oil spill modelling study. The unweathered mixture has a density of 937.7 g/cm^3 (at 16°C), a dynamic viscosity of 161 cP and a pour point of -24°C, which ensures that this crude will remain in a liquid state over the annual temperature range observed on the North West Shelf.

Wandoo Crude is composed of approximately 1.7% (by mass) of volatile hydrocarbons that will evaporate within the first 12 hours. A further 10.2% of the oil is characterised as the semi-volatile hydrocarbon compounds and will evaporate within the first 24 hours while an additional 33.1% represent the low volatiles and will typically evaporate over several days. A relatively high proportion (55%) of hydrocarbon compounds is persistent which are unlikely to evaporate and will decay over time.

Key Findings

The key findings of the study are listed below.

Area of surface oil:

The use of surface dispersant demonstrated a noticeable reduction of the sea surface exposure at, or above the moderate threshold, hence resulting in a lesser number of environmental receptors potentially exposed to surface hydrocarbons.

- The maximum distances from the release location to the moderate (10–25 g/m^2) and high (> 25 g/m^2) exposure thresholds was 902 km west and 369 km west-southwest, respectively, for the unmitigated case and 685 km north (summer) and 358 km west-southwest (transitional), respectively, for the mitigated case

Length of shoreline contact:

- For all seasonal conditions assessed, the modelling demonstrated a reduction in the length of shoreline contact (above 10 g/m^2), when the surface dispersant was applied.

- For the unmitigated case, the greatest length of shoreline contact at, or above, the low threshold (10 g/m^2) during the summer, transitional and winter seasons was 898 km, 227 km and 233 km, respectively, compared to 691 km, 160 km, 190 km for the mitigated case, or a reduction of 30%, 42% and 22%, respectively.

Volume of oil on shore:

- The greatest volume of oil on shore from a single spill trajectory was predicted to reduce from 5,606 m^3, to 2,737 m^3 when the mitigation option was considered. This represented a reduction of 45%.

Dissolved hydrocarbon exposure:

Overall there was an increase for the dissolved hydrocarbon exposure within the 0-10 m and 10-20 m depth layers following the application of surface dispersant. However, it is worth noting that none of the receptors assessed were predicted to be exposed at, or above the high (≥ 400 ppb) threshold.

- In the surface (0-10 m) depth layer, the Pilbara (offshore) IMCRA recorded the greatest probability of instantaneous dissolved hydrocarbon exposure at low threshold during all three seasons for the unmitigated (89 – 94%) and mitigated (100%) cases.

- In the 10-20 m depth layer, the Pilbara (offshore) IMCRA was predicted to be exposed to instantaneous dissolved hydrocarbons (above the low threshold) with probabilities ranging from 79% (transitional) to 92% (winter) for the unmitigated case and 92% (transitional) to 100% (winter) for the mitigated case.

Entrained hydrocarbon exposure

There was an increase in the extent of entrained hydrocarbon exposure within the 0-10 m depth layer following the application of surface dispersant.

The modelling showed during winter conditions demonstrated a broader range of sensitive receptors were exposed compared to summer and transitional months.

GOC367176 VERMILION KULLINGAL OIL SPILL MODELLING (FINAL; DECEMBER 2024)

EXECUTIVE SUMMARY

Background

Vermilion Oil and Gas Australia Pty Ltd (VOGA) operates the Wandoo field, located approximately 70 km northwest of Dampier, Western Australia, in waters approximately 50 m deep.

To support the preparation of the Environment Plan (EP) and Oil Pollution Emergency Plan (OPEP) for the Kullingal well exploration drilling activity, a detailed oil spill modelling study was commissioned. This study assessed the following two hypothetical scenarios:

- **Scenario 1:** A 167,800 bbl (26,678 m^3) surface release of Wandoo crude over 35 days following a loss of well control (LOWC) at Kullingal; and
- **Scenario 2:** A 300 m^3 surface release of marine diesel oil (MDO) over 6 hours following a vessel collision at Kullingal.

The potential exposure of surrounding waters and shorelines was assessed and presented for the distinct seasons, summer (October to February), winter (April to July) and transitional (March, August and September). The modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that would be implemented in response to the spill.

Methodology

The modelling study was carried out in stages. Firstly, a 10-year wind and current dataset (2010–2019) that includes the combined influence of large-scale ocean and tidal currents was prepared. Secondly, the currents, local winds and detailed hydrocarbon characteristics were used as inputs in the three-dimensional oil spill model (SIMAP) to simulate the drift, spread, weathering and fate of the spilled oil.

Modelling was conducted using a stochastic (or probabilistic) approach, which involved running 100 spill simulations per season and each simulation had the same spill information (spill volume, duration and composition of hydrocarbons) but randomly selected start times to ensure a range of wind and current conditions were assessed. Once all 100 simulations per season were run, the results were combined to determine the potential exposure to the surrounding waters, shorelines and sensitive receptors based on the thresholds outlined in the NOPSEMA Oil Spill Modelling Bulletin (NOPSEMA, 2019).

Oil Properties

Wandoo Crude (API 19.4) was used for this oil spill modelling study. The unweathered mixture has a density of 937.7 g/cm^3 (at 16°C), a dynamic viscosity of 161 cP and a pour point of -24°C, which ensures that this crude will remain in a liquid state over the annual temperature range observed.

Wandoo Crude is composed of approximately 1.7% (by mass) of volatile hydrocarbons that will evaporate within the first 12 hours. A further 10.2% of the oil is characterised as the semi-volatile compounds that will likely evaporate within the first 24 hours when on the surface and the additional 33.1% represent the low volatiles which typically evaporate over several weeks. A relatively high proportion (55%) of hydrocarbon compounds is persistent, which are unlikely to evaporate and will decay over time. It is categorised as a Group IV (or persistent) oil according to both oil classifications for AMSA (2023).

The MDO has a density of 890.0 kg/m^3 at 15ºC (API of 27.5) and a low pour point of -9.0°C. The low viscosity (14.0 cP at 25ºC) indicates that this oil will spread quickly when released and will form a thin to low thickness film on the sea surface, increasing the rate of evaporation. Generally, about 4% of the MDO mass should evaporate within the first 12 hours (Boiling point (BP) < 180°C); a further 32.0% should evaporate within the first 24 hours (180°C < BP < 265°C); and an additional 54.0% should evaporate over several days (265°C < BP < 380°C). Approximately 10% (by mass) of MDO will not evaporate, though will decay slowly over time. It is categorised as a Group II oil (light-persistent) according to the AMSA (2023) classifications.

Summary of Modelling Results

Summary of key results

Scenario description		Scenario 1 – Surface LOWC	Scenario 2 - Vessel collision
Spill volume		167,800 bbl (26,678 m^3)	300 m^3
Oil type		Wandoo crude	MDO
Release depth		0 m (surface)	0 m (surface)
Release duration		35 days	6 hours
Simulation length		56 days	30 days
Floating Oil Exposure	Maximum distances from the release location to floating oil exposure thresholds	Floating oil concentrations ≥ 1 g/m^2 could extend up to 998 km from the release location. The maximum distances reduced to 473 km and 25 km as the threshold increases to ≥ 10 g/m^2 and ≥ 50 g/m^2, respectively.	Floating oil concentrations ≥ 1 g/m^2 could extend up to 31 km from the release location. The maximum distances reduced to 18 km and 6 km as the threshold increases to ≥ 10 g/m^2 and ≥ 50 g/m^2, respectively.
	Highest probability of floating oil exposure to a receptor at, or above, 1 g/m^2	Mermaid Reef AMP, 97% during winter conditions	NC
	Quickest time before exposure to a receptor at, or above, 1 g/m^2	Montebello AMP, 37 hours during transitional conditions	NC
Shoreline Oil Accumulation	Probability of oil accumulation on **any** shoreline at, or above, 10 g/m^2	100% during winter conditions	24% during winter conditions
	Absolute minimum time for oil to accumulate on shoreline cells at ,or above, 10 g/m^2	WA11.West (318) - Barrow Island and Montebello Islands (A), 69 hours during winter conditions	WA11.West (318) - Barrow Island and Montebello Islands (A), 91 hours during winter conditions
	Maximum volume of oil ashore from a single spill simulation at, or above, 10 g/m^2	4,550.0 m^3 during summer conditions	23.2 m^3 during winter conditions
	Highest probability of oil accumulation for a specific shoreline cell at, or above, 10 g/m^2	WA11.West (318) - Barrow Island and Montebello Islands (A), 92% during winter conditions	WA11.West (318) - Barrow Island and Montebello Islands (A), 15% during winter conditions

Scenario description		Scenario 1 – Surface LOWC	Scenario 2 - Vessel collision
	Maximum volume of oil ashore from a single spill simulation for a specific shoreline cell at, or above, 10 g/m^2	2,570 m^3, WA11,West (318) - Barrow Island and Montebello Islands (A), during transitional conditions	23.2 m^3, WA11,West (318) - Barrow Island and Montebello Islands (A), during winter conditions
Dissolved Hydrocarbons	Maximum distances from the release location to dissolved hydrocarbon exposure thresholds	Concentrations ≥ 10 ppb threshold may extend up to 790 km from the release location. As the threshold increases to 50 ppb, the maximum distance decreases to 425 km. No exposure was predicted above 400 ppb.	Concentrations ≥ 10 ppb threshold may extend up to 169 km from the release location. As the threshold increases to 50 ppb, the maximum distance decreases to 58 km. No exposure was predicted above 400 ppb.
	Highest probability of dissolved hydrocarbon exposure to a receptor at, or above, 10 ppb	Montebello AMP, 89% during winter conditions	Montebello AMP, 7% during winter conditions
	Quickest time before exposure to a receptor at, or above, 10 ppb	Montebello AMP, 26 hours during summer conditions	Montebello AMP, 27 hours during transitional conditions
Entrained Hydrocarbons	Maximum distances from the release location to entrained hydrocarbons exposure thresholds	Concentrations ≥ 10 ppb threshold may extend up to 1,302 km from the release location. As the threshold increases to ≥ 100 ppb, the maximum distance decreases to 1,037 km.	Concentrations ≥ 10 ppb threshold may extend up to 494 km from the release location. As the threshold increases to ≥ 100 ppb, the maximum distance decreases to 237 km.
	Highest probability of entrained hydrocarbon exposure to a receptor at, or above, 10 ppb	Montebello AMP, 99% during winter conditions	Montebello AMP, 54% during winter conditions
	Quickest time before exposure to a receptor at, or above, 10 ppb	Montebello AMP, 21 hours during summer and winter conditions	Montebello AMP, 22 hours during winter conditions

NC: No contact to receptor predicted for specified threshold.

Appendix E
Spill Impact Mitigation Assessment

1. The SIMA process

The Spill Impact Mitigation Assessment (SIMA) process provides a means to determine the environmental gain/reduction from implementing each response strategy by considering the potential impacts on each identified protection priority, and will enable informed decisions to be made.

2. Responsibility to complete the SIMA

A SIMA is most likely to be undertaken by the Environment Unit team leader with assistance from the Planning Chief. Advice from the Operations Chief regarding the execution of response strategies (i.e. limitations, constraints, advantages of strategy); and the Resource Unit team leader or Logistics Chief regarding resource availability will also be sought.

3. Information requirements for the SIMA process

- A copy of the OPP for the spill category.
- Current situation report (SITREP from) that includes details about the spill, weather, currents and tides, action taken to date, forecast situation.
- Outputs from Operational Monitoring such as:
  - oil spill trajectory model outputs from previous studies
  - forecast oil spill trajectory model outputs based on real time spill and metocean conditions
  - preferred response options from the OPEP
  - sensitive resources at risk from oiling
  - laboratory data such as dispersant efficacy, oil weathering characteristics
  - outputs from response strategy monitoring and evaluation (e.g., aerial surveillance).
- Knowledge of response strategy impacts, advantages, constraints and limitations as outlined in the EPs.

4. How data is used in the SIMA process

Once oil type, quantity, real-time weather information and a trajectory pathway are known, the sensitivities within the EMBA and Hydrocarbon Area need to be identified. Review the protection priority ranking that has been provided in the OPPs and consider:

- Outputs from OSTM analysis:
  - the probability of impact – will the response strategy reduce the probability of impact sensitive receptor?
  - minimum time to impact (days) – will the response strategy increase the number of days before impact sensitive receptor?

  - severity of impact (quantity of oil) – will the response strategy reduce the average and/or total amount of oil to impact sensitive receptor?

- Impacts associated with the proposed response strategy – will the response operation have more of a negative impact than untreated oil?
- The recovery time of the sensitive receptor after exposure to hydrocarbons – is recovery time likely to be short or long term?

5. Recommended response strategies and controls

Response strategy recommendations are made at the conclusion of the SIMA process and controls identified to minimise the impacts associated with response operations. Development of response strategy controls is the last step of the SIMA process to ensure that the operation does not have an more of a negative impact than the spill alone. Controls are defined according to:

- risk, impacts and benefits associated with each strategy and whether it is consistent with the EP
- environmental sensitivities and their priority (environmental significance, severity of impact and recovery time) as per Table C-1 and Table C-
- seasonal and migratory patterns as per Table C-2
- fish and coral spawning times whale aggregation periods
- State (WA) jurisdictional requirements and approvals.

Consideration of the environmental benefit for each strategy has also been considered when preparing the Oil Pollution Plans in the OPEP and are represented in Table C-2. This information is used in the SIMA when assessing proposed response strategies and attention should be paid to the notes that accompany the headings in this table.

For each sensitive receptor, independently assess each response strategy for suitability by determining whether its use will result in an increase or decrease in environmental benefit. If there are conflicting outcomes for a particular response option then the sensitive receptor with the higher priority becomes the preferred response option.

A check of the decision then needs to be made to ensure that the risks and impacts associated with the response options are consistent with those identified in the EPs. If the risks and impacts are not consistent with those identified in the EPs then the following will occur:

- response strategy controls are identified and assessed
- an alternative response strategy is assessed, or
- an application for approval to implement the response strategy will be made.

6. Protection priorities

A decision must be made as to which sensitive receptors have the highest protection and/or clean-up priority and which response strategy/strategies will result in an overall net environmental benefit. Priority shorelines and habitats are mangroves, turtle nesting beaches during nesting and hatching season and significant bird breeding/nesting sites. Table C-1 is a

graphic representation of protection priorities for habitats or shoreline considering the recovery time and potential impact from oil.

Table C-2: Protection priority matrix (obtained from AMOSC training material)

		RECOVERY TIME RAPID ← → SLOW			
		<1 year	2-5 years	5-10 years	>10 years
Potential Impact Rank	Slight	Low	Low	Low	Medium
	Minor	Low	Medium	Medium	High
	Major	Low	Medium	High	High
	Severe	Medium	High	High	High

7. SIMA frequency

The SIMA will be completed on the following timeline:

- within 6 hours – a preliminary SIMA to identify indicative protection priorities and response options
- within 24 hours of the spill as part of the OPEP
- every 24 hours as part of the IAP cycle
- as required if the situation changes beyond what is planned for and response strategies require evaluation
- until termination criteria are met for response strategies and ultimately the incident.

8. Decision making toolbox

A number of tools exist that can aid the Environment Unit leader and Planning Chief in completing a SIMA for an oil spill response are available in the ICT Toolbox. Specific sections within the Exploration and Survey Operations OPEP and associated EP are identified.

Table C-3 SIMA Matrix

Sensitivity	Protection Priority[1] **(based on likelihood of impact, severity of impact and recovery time)**	Seasonal presence in EMBA												Response Strategy **(↑ Increase in environmental benefit; ↓ Decrease in environmental benefit; X not applicable)**					
		J	F	M	A	M	J	J	A	S	O	N	D	Monitor and evaluate[2]	Chemical dispersant [3]	Mechanical dispersion[4]	Contain and recover[5]	Protect and deflect[6]	Shoreline clean-up[7]
Ecological																			
Whales (resting/calving)	High (T,M)							✓	✓	✓	✓			↑	↓	↑	↑	X	X
Dugongs (foraging)	High (M)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↓	↑	↑	X	X
Dolphins	High (M)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↓	↑	↑	X	X
Sharks	High (T,M)			✓	✓	✓	✓							↑	↓	↑	↑	X	X
Turtle nesting	High (T,M)	✓	✓	✓						✓	✓	✓	✓	↑	↑	↑	↑	↑	↑
Migratory birds	High (T,M)	✓	✓	✓	✓					✓	✓	✓	✓	↑	↑	↑	↑	↑	↑
Sea birds	Medium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↑	↑	↑	X	X
Shore birds	Medium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↑	↑	↑	↑	↑
Coral spawning	Medium	✓	✓	✓	✓					✓	✓	✓	✓	↑	↓	↑	↑	X	X
Habitat/Ecosystem																			
Mangroves	High	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↑	↑	↑	↑	↓
Intertidal rocky reef	Medium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↓	↓	↑	X	X
Coral reef	Medium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↓	↓	↑	X	X
Seagrasses	Medium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↓	↓	↑	X	X
Marshland	Medium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↑	↑	↑	↑	↓
Mudflats	Medium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↑	↑	↑	↑	↓
Subtidal rocky reef	Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↓	↓	↑	X	X
Sandy beaches	Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↑	↑	↑	↑	↑
Rocky shore	Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↑	↑	↑	↑	X
Open waters	Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↓	↑	↑	X	X

Sensitivity	Protection Priority[1] **(based on likelihood of impact, severity of impact and recovery time)**	Seasonal presence in EMBA												Response Strategy **(↑ Increase in environmental benefit; ↓ Decrease in environmental benefit; X not applicable)**					
		J	F	M	A	M	J	J	A	S	O	N	D	Monitor and evaluate[2]	Chemical dispersant [3]	Mechanical dispersion[4]	Contain and recover[5]	Protect and deflect[6]	Shoreline clean-up[7]
Socioeconomic																			
Protected shipwrecks	Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↓	↓	↑	↑	X
Fisheries	Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↓	↓	↑	↑	X
Petroleum activity	Low	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	↑	↑	↑	↑	↑	X

1 Protection priority: This ranking is based on a combination of factors including the likelihood of impact (time of year), severity of impact (type of exposure to the sensitivity, where the sensitivity is listed as Threatened (T) or Migratory (M) under the EPBC Act) and recovery time after exposure to hydrocarbons. Table 6 1 can be used to assess the risk of sensitivity).

2 Monitor and evaluate: This strategy is important for gathering and maintaining situational awareness throughout a response and will always have a positive benefit.

3 Chemical dispersant: Each sensitivity in the above table must be assessed independently and each strategy must also be assessed independently. Where chemical dispersant has been given a ↓, this indicates that when used alone chemical dispersant will reduce the overall environmental benefit.

The purpose of applying chemical dispersant is to break up the surface oil into small droplets of oil and to suspend the oil through the water column to accelerate the breakdown process through biodegradation. Effective dispersant application is capable of reducing the amount of oil that could potentially reach the shoreline as a surface slick.

For some species/habitats the use of chemical dispersants has been shown to reduce the severity of hydrocarbon impact. Dispersing oil into the water column reduces the quantity of oil on the surface, subsequently reducing the amount of oil that can strand and smother any resource in which it comes into contact with, i.e. mangrove pneumatophores (rhizomes that grow upwards vertically out of the mud – used for respiration and salt balance). Mangroves support a vast ecosystem of organisms below the water surface, as do seagrass beds. Dispersed oil in the water column is likely to have an adverse impact compared with oil remaining on the sea surface.

4 Mechanical dispersion: This strategy will have a positive benefit where it is beneficial to assist with the natural dispersion process, encouraging an oil slick to evaporate and mix becoming suspended within the water column where it can be more easily biodegraded. Mechanical dispersion will be more effective on smaller spills where the expected fate of the hydrocarbon is to evaporate and disperse within 24-72 hours or where it is used to assist with chemical dispersion when sea conditions are calm.

5 Containment and recovery: The containment of an oil slick with boom and recovery using mechanical devices minimises the severity of impact to sensitivities by reducing the quantity of product that could come in to contact with sensitivity. Where it is operationally feasible to use this equipment the result will have a positive environmental benefit.

6 Protection and deflection: The deployment of protection and deflection boom can assist with minimising the potential impact and/or deflecting an oil slick away from a known sensitivity towards an area where collection can be more effective. This strategy is dependent on the right environmental conditions and habitat type, however it has the capacity to have a very positive environmental benefit.

7 Shoreline clean-up: Where shoreline clean-up has been given a ↓, this indicates that the use of equipment, machinery and personnel in that environment is likely to have negative effect, potentially causing more damage and reducing the recovery and environmental benefit to that sensitivity.

NOTE: A SIMA is a decision-making process and will ultimately result in a trade-off of priorities and response strategies. It is possible for a response strategy to be used for one sensitivity – even if it has been identified that this response option may not benefit one or several other sensitivities. The final outcome of the response however should result in an overall net environment benefit.

9. References in the OPEP and EP that can assist in completing the SIMA template

The following sections of the OSCP may assist the Environment Unit leader and Planning Chief to complete the SIMA template:

- response strategies
- Oil Pollution Plans
- termination criteria.

The following sections of the EPs can assist the Planning Chief to complete the SIMA template:

- description of the environment
- key sensitivities and potential impacts
- impact assessment of oil spill scenarios and response strategies (EP Hazard Report Tables)
- OSTM outputs.

10. External References for Environmental Sensitivity Identification

- DoT Regional Protection Priority Assessments (i.e. for Zone 2: Pilbara – Final Report; 16 Oct 2017)
- WA Oiled Wildlife Response Plan (WAOWRP) and the Pilbara Region Oiled Wildlife Response Plan (POWRP).

Appendix F Consultation Report

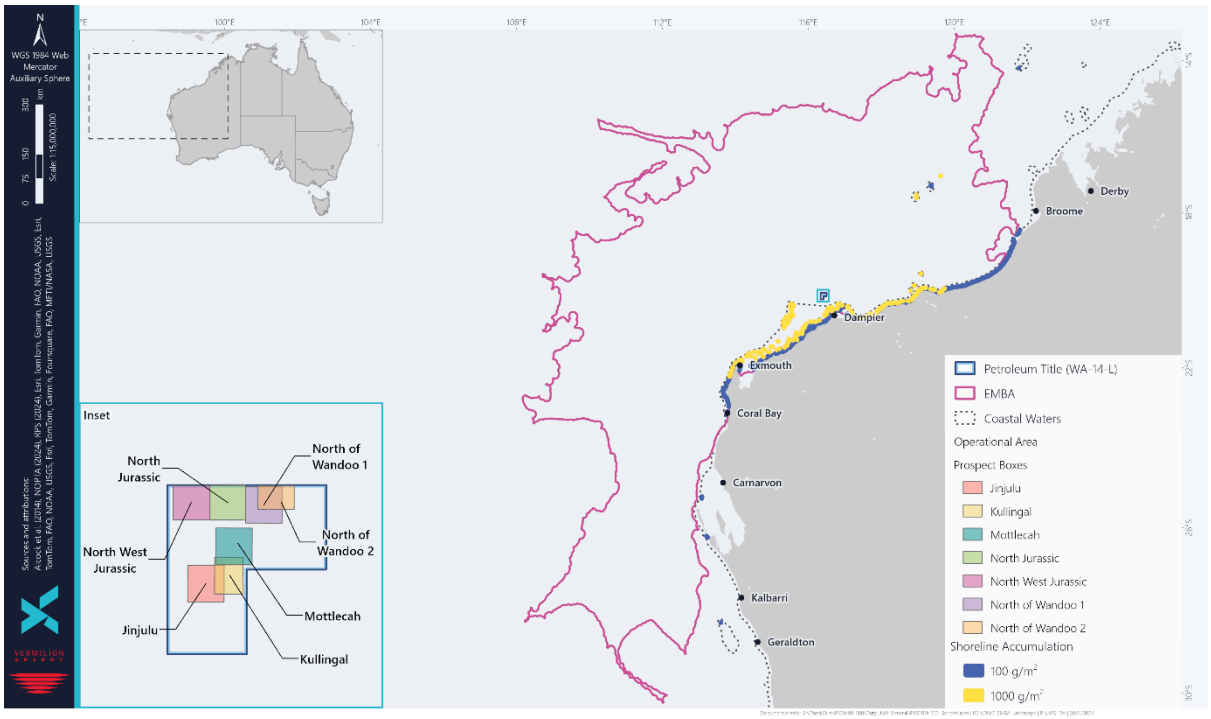
Appendix F Consultation Summary and Report

1.1 Environment That May be Affected

The Environment that May Be Affected (EMBA) is the largest spatial extent where unplanned events could have an environmental consequence on the surrounding environment.

VOGA's identification and assessment of relevant persons is based on the Operational Area and the EMBA.

Figure 1-1: VOGA's consultation methodology and process



1.2 Relevancy Assessment

VOGA undertook an assessment of identified relevant persons based on the Operational Area and EMBA. The result of this assessment is outlined in Table 1.

Table 2: Assessment of relevant persons

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
Section 25(1)(a) of the OPGGS(E)R: Departments or agencies of the Commonwealth to which the activities to be carried out under the environment plan may be relevant			
Commonwealth Government Departments and Agencies			
Australian Border Force (ABF) (Maritime Border Command)	Responsible for coordinating maritime security	ABF's responsibilities may be relevant to the activity as there are proposed vessel activities.	Yes
Australian Fisheries Management Authority (AFMA)	Responsible for managing Commonwealth fisheries	AFMA's functions may be relevant to the activity as the Southern Bluefin Tuna Fishery, Western Skipjack Tuna Fishery, and Western Tuna and Billfish Fishery management areas overlap the Operational Area, however no fishing activity is expected.	Yes
Australian Hydrographic Office (AHO)	Responsible for maritime safety and Notices to Mariners	AHO's responsibilities may be relevant to the activity as there are proposed vessel activities.	Yes
Australian Maritime Safety Authority (AMSA) – maritime safety	Statutory agency for vessel safety and navigation	AMSA – Marine Safety's responsibilities may be relevant to the activity as there are proposed vessel activities.	Yes
Australian Maritime Safety Authority (AMSA) – marine pollution	Statutory agency to combat pollution in the marine environment	AMSA – Marine Pollution's responsibilities may be relevant to the activity as the proposed activity has a hydrocarbon spill risk which may require AMSA response in Commonwealth waters.	Yes
Department of Agriculture, Forestry and Fisheries (DAFF) – Biosecurity (marine pests) (vessels, aircraft and personnel)	DAFF administers, implements and enforces the Biosecurity Act 2015. The Department requests to be consulted where an activity has the potential to transfer marine pests. DAFF also has inspection and reporting requirements to ensure that all conveyances (vessels, installations and aircraft) arriving in Australian territory comply with international health regulations and that any biosecurity risk is managed. The Department requests to be consulted where an activity involves the movement of aircraft or vessels	DAFF administers the Biosecurity Act 2015 (Cth) which is designed to contain and/or deal with diseases and pests that may cause harm to human, animal or plant health or the environment in Australia. DAFF is a relevant agency for consultation because the activity involves the movement of vessels into Australian territory and/or between Australian ports and offshore petroleum facilities.	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
	between Australia and offshore petroleum activities either inside or outside Australian territory.		
Department of Agriculture, Forestry and Fisheries (DAFF) – Fisheries	Responsible for implementing Commonwealth policies and programs to support agriculture, fishery, food and forestry industries	DAFF Fisheries' responsibilities may be relevant to the activity as the Southern Bluefin Tuna Fishery, Western Skipjack Tuna Fishery, and Western Tuna and Billfish Fishery management areas overlap the Operational Area, however no fishing activity is expected.	Yes
Department of Climate Change, Energy, the Environment and Water (DCCEEW) – Underwater Cultural Heritage (UCH)	Responsible for implementing Commonwealth policies and programs to support climate change, sustainable energy use, water resources, the environment and our heritage. Administers the Underwater Cultural Heritage Act 2018 in collaboration with the States, Northern Territory and Norfolk Island, which is responsible for the protection of shipwrecks, sunken aircraft and other types of underwater heritage and their associated artefacts in Commonwealth waters.	DCCEEW protects Australia's natural environment and heritage sites, helps Australia respond to climate change and carefully manages water and energy resources. The Underwater Cultural Heritage branch at DCCEEW is responsible for administering the UCH Act. It is a relevant agency where an activity has the potential to directly or indirectly adversely impact protected UCH.	Yes
Department of Defence (DoD)	Responsible for defending Australia and its national interests.	DoD's responsibilities may be relevant to the activity because the proposed activity may impact DoD training and operational requirements, in that the EMBA overlaps DoD training areas.	Yes
Department of Industry, Science and Resources (DISR)	Department of relevant Commonwealth Minister	Required to be consulted under regulation 25(1)(a) of the Environment Regulations. DISR is a relevant agency for consultation because its responsibilities include offshore oil and gas development and safety and GHG storage.	Yes
Director of National Parks (DNP)	Responsible for the management of Commonwealth parks and conservation zones.	DNP's responsibilities may be relevant to the activity as DNP requires an awareness of activities that occur within AMPs, and an understanding of potential impacts and risks to the values of parks (NOPSEMA guidance note: N-04750- GN1785 A620236, June 2020).	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
		Titleholders are required to consult DNP on offshore petroleum and greenhouse gas exploration activities if they occur in, or may impact on the values of marine parks, including where potential spill response activities may occur in the event of a spill (i.e. scientific monitoring). The EMBA overlaps AMPs.	
Section 25(1)(a) and (b) of the OPGGS(E)R: Departments or agencies of Western Australia to which the activities to be carried out under the environment plan may be relevant.			
State Government Departments and Agencies			
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)	Department of relevant State Minister	Required to be consulted under regulation 25(1)(c) of the Environment Regulations.	Yes
Department of Planning, Lands and Heritage (DPLH)	Responsible for state level land use planning and management, and oversight of Aboriginal cultural heritage and built heritage matters.	There are known maritime cultural heritage overlapping the EMBA.	Yes
Department of Biodiversity, Conservation and Attractions (DBCA)	Responsible for managing WA's parks, forests and reserves to achieve wildlife conservation and provide sustainable recreation and tourism opportunities.	The DBCA's responsibilities may be relevant to the activity as the EMBA overlaps WA parks, forests or reserves. Activities have the potential to impact marine tourism in the EMBA.	Yes
Department of Primary Industries and Regional Development (DPIRD) – Fisheries	Responsible for managing State fisheries	The Mackerel Managed Fishery Area 2, Onslow Prawn Limited Entry Fishery, Pilbara Crab Managed Fishery, Pilbara Line Fishery, Pilbara Fish Trawl Interim Managed Fishery, Pilbara Trap Managed Fishery, and West Coast Rock Lobster Managed Fishery are active in the Operational Area. The Mackerel Managed Fishery Area 2, Onslow Prawn Limited Entry Fishery, Pilbara Crab Managed Fishery, Pilbara Line Fishery, Pilbara Fish Trawl Interim Managed Fishery, Pilbara Trap Managed Fishery, and West Coast Rock Lobster Managed Fishery have been active in the EMBA within the last 5 years.	Yes

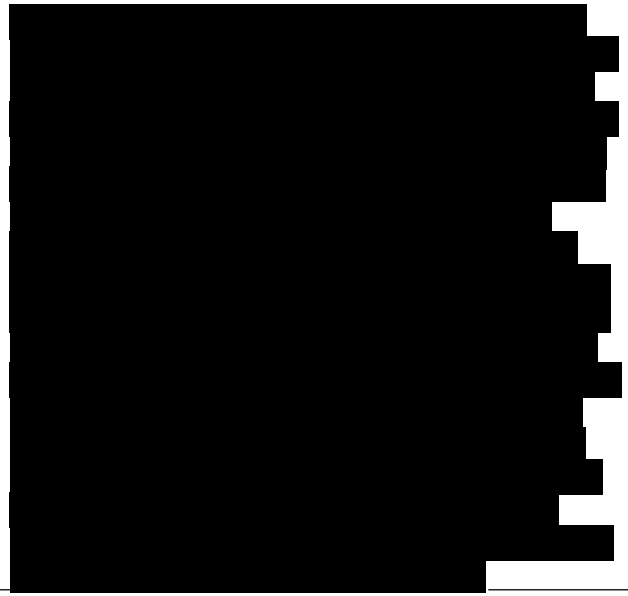
Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
		DPIRD's responsibilities may be relevant to the activity as the government department responsible for State fisheries.	
Department of Transport (DoT) – marine pollution	Legislated responsibility for oil pollution response in State waters	The proposed activity has a hydrocarbon spill risk, which may require DoT response in State waters.	Yes
Ningaloo Coast World Heritage Advisory Committee (NCWHAC)	Supports the DBCA to manage the Ningaloo Coast World Heritage Area.	The NCWHAC's responsibilities may be relevant to the activity as the EMBA overlaps the Ningaloo Marine Park.	Yes
Pilbara Development Commission (PDC)	Statutory authority of the WA Government that partners with communities, government, business and industry to identify and support projects.	The PDC's functions or interests may be relevant to the activity as the EMBA overlaps with its area of responsibilities.	Yes
Pilbara Ports Authority (PPA)	Encompasses the Ports of Ashburton, Dampier, Port Hedland and Varanus Island. PPA oversees the Shipping and Pilotage Act 1967 (SPA) ports of Barrow Island, Cape Preston, Onslow and Port Walcott.	The proposed activity has the potential to impact PPA's responsibilities, as the EMBA overlaps the Pilbara Ports Authority's area of responsibility.	Yes
Section 25(1)(d) of the OPGGS(E)R: Persons or organisations whose functions, interests or activities may be affected by the activities to be carried out under the environment plan			
Commonwealth commercial fishing - representative bodies			
Australian Southern Bluefin Tuna Fishery Association (ASBITA)	Represents the interests of the Southern Bluefin Tuna Fishery and the Western Skipjack Tuna Fishery	The ASBITA have been assessed as not relevant to the proposed activity. As the representative body for the Southern Bluefin Tuna Fishery and the Western Skipjack Tuna Fishery, the ASBITA has also been assessed as not relevant. VOGA chose to contact ASBITA at its discretion.	No
Commonwealth Fisheries Association (CFA)	Represents the interests of commercial fishers license holders in Commonwealth waters.	There are Commonwealth commercial fisheries in the Operational Area, with management areas that overlap the EMBA. CFA's functions may be relevant to the activity. CFA was recommended for consultation by the Australian Fisheries Management Authority. VOGA chose to contact CFA at its discretion.	No

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
Pearl Producers Association (PPA)	Represents the Australian South Sea Pearling Industry. Members in NT and WA.	The Pearl Oyster Managed Fishery has been assessed as not relevant to the proposed activity. As the representative body for the Pearl Oyster Managed Fishery, the PPA has also been assessed as not relevant. VOGA chose to contact PPA at its discretion.	No
Tuna Australia (TA)	Represents the interests of the Western Tuna and Billfish Fishery	The Western Tuna and Billfish Fishery has been assessed as not relevant to the proposed activity. As the representative body for the Western Tuna and Billfish Fishery, Tuna Australia has also been assessed as not relevant. VOGA chose to contact Tuna Australia at its discretion.	No
Seafood Industry Australia (SIA)	Represents the interests of the Seafood Industry in Australia.	SIA has been assessed as not relevant to the proposed activity and was recommended for consultation by the Australian Fisheries Management Authority. VOGA chose to contact SIA at its discretion.	No
Western Rock Lobster Council (WRLC)	Represents the interests of the Western Rock Lobster Managed Fishery	The West Coast Rock Lobster Managed Fishery has been assessed as relevant to the proposed activity. As the representative body for the West Coast Rock Lobster Managed Fishery, the Western Rock Lobster Council has also been assessed as relevant.	Yes
Commonwealth commercial fisheries			
Southern Bluefin Tuna Fishery	Commonwealth commercial fishery	Although the fishery overlaps the Operational Area and EMBA, the fishery has not been active in the Operational Area or EMBA within the last 5 years.	No
Western Skipjack Tuna Fishery	Commonwealth commercial fishery	Although the fishery overlaps the Operational Area and EMBA, the fishery has not been active in the Operational Area or EMBA within the last 5 years.	No
Western Tuna and Billfish Fishery	Commonwealth commercial fishery	Although the fishery overlaps the Operational Area and EMBA, the fishery has not been active in the Operational Area or EMBA within the last 5 years.	No
State commercial fishing - representative bodies			

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
Western Australian Fishing Industry Council (WAFIC)	WAFIC represents the interests of the WA commercial fishing, pearling and aquaculture sector.	There are active State commercial fisheries in the Operational Area. WAFIC's functions may be relevant to the activity as the representative body for State fisheries. WAFIC issued consultation material to relevant commercial fisheries licence holders under a services agreement.	Yes
State commercial fisheries			
Mackerel Managed Fishery - Area 2	State commercial fishery	The fishery overlaps the Operational Area and has been active in the Operational Area within the last 5 years. The fishery overlaps the EMBA and has been active in the EMBA within the last 5 years. Under an agreement, WAFIC recommended consultation with this fishery and distributed consultation information on behalf of VOGA.	Yes
Onslow Prawn Limited Entry Fishery	State commercial fishery	The fishery overlaps the Operational Area and has been active in the Operational Area within the last 5 years. The fishery overlaps the EMBA and has been active in the EMBA within the last 5 years. Under an agreement, WAFIC recommended consultation with this fishery and distributed consultation information on behalf of VOGA.	Yes
Pilbara Crab Managed Fishery	State commercial fishery	The fishery overlaps the Operational Area and has been active in the Operational Area within the last 5 years. The fishery overlaps the EMBA and has been active in the EMBA within the last 5 years. Under an agreement, WAFIC recommended consultation with this fishery and distributed consultation information on behalf of VOGA.	Yes
Pilbara Line Fishery (Condition)	State commercial fishery	The fishery overlaps the Operational Area and has been active in the Operational Area within the last 5 years. The fishery overlaps the EMBA and has been active in the EMBA within the last 5 years. Under an agreement,	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
		WAFIC recommended consultation with this fishery and distributed consultation information on behalf of VOGA.	
Pilbara Fish Trawl Interim Managed Fishery	State commercial fishery	The fishery overlaps the Operational Area and has been active in the Operational Area within the last 5 years. The fishery overlaps the EMBA and has been active in the EMBA within the last 5 years. Under an agreement, WAFIC recommended consultation with this fishery and distributed consultation information on behalf of VOGA.	Yes
Pilbara Trap Managed Fishery	State commercial fishery	The fishery overlaps the Operational Area and has been active in the Operational Area within the last 5 years. The fishery overlaps the EMBA and has been active in the EMBA within the last 5 years. Under an agreement, WAFIC recommended consultation with this fishery and distributed consultation information on behalf of VOGA.	Yes
West Coast Rock Lobster Managed Fishery	State commercial fishery	The fishery overlaps the Operational Area and has been active in the Operational Area within the last 5 years. The fishery overlaps the EMBA and has been active in the EMBA within the last 5 years. Under an agreement, WAFIC recommended consultation with this fishery and distributed consultation information on behalf of VOGA.	Yes
Recreational fishers and marine users and peak representative bodies			
WA Game Fishing Association (WAGFA)	Represents the interests of game fishers in WA.	Activities have the potential to impact game fishers' functions, interests or activities due to the location offshore and there has been recorded charter effort in the EMBA in the past 5 years.	Yes
Recfishwest	Represents the interests of recreational fishers in WA.	Activities have the potential to impact game fishers' functions, interests or activities due to the location offshore and there has been recorded charter effort in the EMBA in the past 5 years.	Yes
Marine Tourism WA	Represents the interests of marine tourism in WA.	Activities have the potential to impact game fishers' functions, interests or activities due to the location	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
		offshore and there has been recorded charter effort in the EMBA in the past 5 years.	
Ashburton Anglers	Represents the interests of recreational fishers in WA.	Activities have the potential to impact game fishers' functions, interests or activities.	Yes
Exmouth Game Fishing Club (EGFC)	Represents the interests of recreational fishers in WA.	Activities have the potential to impact game fishers' functions, interests or activities.	Yes
King Bay Game Fishing Club (KBFC)	Represents the interests of recreational fishers in WA.	Activities have the potential to impact game fishers' functions, interests or activities.	Yes
Nickol Bay Sportsfishing Club (NBSC)	Represents the interests of recreational fishers in WA.	Activities have the potential to impact game fishers' functions, interests or activities.	Yes
Pilbara / Kimberley Recreational Marine Users	Pilbara & Kimberley-based dive, tourism and charter operators	Activities have the potential to impact Pilbara/Kimberley-based dive, tourism and charter operator's functions, interests or activities due to the location of activities and there has been recorded charter effort in the EMBA in the past 5 years. 	Yes
Gascoyne Recreational Marine Users	Gascoyne-based dive, tourism and charter operators	Activities have the potential to impact Gascoyne-based dive, tourism and charter operator's functions, interests	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
		or activities due to the location of activities and there has been recorded charter effort in the EMBA in the past 5 years. 	
West Coast Recreational Marine Users	West Coast based dive, tourism and charter operators	Activities have the potential to impact West-coast-based dive, tourism and charter operator's functions, interests or activities due to the location of activities and there has been recorded charter effort in the EMBA in the past 5 years. 	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
		[redacted]	

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
		[redacted]	
Energy industry titleholders and operators			
3D Energi Limited	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Beagle No. 1 Pty Ltd / Longreach Capital Investment	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Bengal Energy Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
BP Developments Australia	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Chevron Australia	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Eni Australia B.V.	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
EOG Resources Australia Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Finder No 16 Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
INPEX Browse E&P Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
IPB WA 424P Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Jadestone Energy (Australia) Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Kato Energy (WA) Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Kufpec (Perth) Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
MEO International Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Mobil Australia Resources Company Pty Limited	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Pathfinder Energy Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Pilot Energy Limited	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Santos Offshore Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Shell Australia Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Triangle Energy (Operations) Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Western Gas (474 P) Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Woodside Energy (Australia) Pty Ltd	Titleholder or Operator	Titleholder or Operator's permit areas overlaps the EMBA.	Yes
Peak industry representative bodies and associations			
Australian Energy Producers (AEP)	Represents the interests of oil and gas explorers and producers in Australia.	AEP's responsibilities are identified as having an intersect with the EMBA.	Yes
Infrastructure operators			

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
Vocus Communications	Owner and operator of an offshore fibre network	Vocus is relevant as its offshore fibre network intersects the EMBA.	Yes
Traditional Custodians and First Nations nominated representative corporations			
Buurabalayji Thalanyji Aboriginal Corporation RNTBC	Prescribed Body Corporation (PBC) - Representative Aboriginal Corporation	The Thalanyji People's determined Native Title claim, which the Buurabalayji Thalanyji Aboriginal Corporation RNTBC is the Prescribed Body Corporation for, does not overlap the EMBA. The determined Native Title claim is coastally adjacent to the EMBA.	Yes
Karajarri Traditional Lands Association (Aboriginal Corporation) RNTBC (KTLAAC)	Representative Aboriginal Corporation	The Karajarri People (Area A) and Karajarri People (Area B) native title claim, which the Karajarri Traditional Lands Association (Aboriginal Corporation) is the Registered Native Title Body Corporate for, overlaps the EMBA. OR The Karajarri People (Area A) / Karajarri People (Area B) native title claim does not overlap the EMBA. The claim is coastally adjacent to the EMBA, for which the Karajarri Traditional Lands Association (Aboriginal Corporation) is the Registered Native Title Body Corporate. The Karajarri and parties to the Karajarri Indigenous Protected Area (IPA), dedicated in 2014, lies south of Broome and includes 130 kilometres of coastline.	Yes
Kariyarra Aboriginal Corporation RNTBC (KAC)	Prescribed Body Corporate (PBC) - Representative Aboriginal Corporation	The Kariyarra People's determined native title claim does not overlap the EMBA. The determined claim is coastally adjacent to the EMBA, for which the Kariyarra Aboriginal Corporation is the Prescribed Body Corporation.	Yes
Malgana Aboriginal Corporation (MAC) (Part A)	Representative Aboriginal Corporation	The Malgana Part A native title claim does not overlap the EMBA. The claim is coastally adjacent to the EMBA,	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
		for which the Malgana Aboriginal Corporation is the Registered Native Title Body Corporate.	
Malgana Aboriginal Corporation RNTBC, Nanda Aboriginal Corporation RNTBC (Part B)	Representative Aboriginal Corporation	The Nanda People Part B, Malgana 2 and Malgana 3 native title claim does not overlap the EMBA. The claim is coastally adjacent to the EMBA, for which the Malgana Aboriginal Corporation and Nanda Aboriginal Corporation are the Registered Native Title Body Corporates.	Yes
Nanda Aboriginal Corporation RNTBC (NAC)	Representative Aboriginal Corporation	The Nanda People and Nanda #2 native title claim does not overlap the EMBA. The claim is coastally adjacent to the EMBA, for which the Nanda Aboriginal Corporation is the Registered Native Title Body Corporate.	Yes
Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC), Yinggarda Aboriginal Corporation (YAC)	Prescribed Body Corporation (PBC) - Representative Aboriginal Corporation	The Gnulli, Gnulli #2 and Gnulli #3 - Yinggarda, Baiyungu and Thalanyji Peoples' native title claim overlaps the EMBA. The NTGAC and YAC are the Registered Native Title Body Corporates holding native title on behalf of the Baiyungu, Thalanyji and Yinggarda people. The NTGAC is also party, with the WA State Government, to the Ningaloo Conservation Estate Indigenous Land Use Agreement (ILUA), which overlaps the EMBA.	Yes
Ngarluma Aboriginal Corporation RNTBC (NAC)	Prescribed Body Corporation (PBC) - Representative Aboriginal Corporation	The Ngarluma People native title claim overlaps the EMBA, which the Ngarluma Aboriginal Corporation is the Registered Native Title Prescribed Body Corporate.	Yes
Nyangumarta Karajarri Aboriginal Corporation RNTBC (NKAC)	Representative Aboriginal Corporation	The Nyangumarta Karajarri People native title claim, which the Nyangumarta Karajarri Aboriginal Corporation RNTBC (NKAC) is the Registered Native Title Body Corporate for, overlaps the EMBA.	Yes
Nyangumarta Warrarn Aboriginal Corporation RNTBC (NWAC)	Representative Aboriginal Corporation	The Nyangumarta People (Part A) native title claim, which the Nyangumarta Warrarn Aboriginal Corporation	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
		RNTBC (NKAC) is the Registered Native Title Body Corporate for, overlaps the EMBA.	
Wanparta Aboriginal Corporation RNTBC (WAC)	Representative Aboriginal Corporation	The Ngarla and Ngarla #2 (Determination Area 2) determined native title claim does not overlap the EMBA. The determined native title claim is coastally adjacent to the EMBA, which the Wanparta Aboriginal Corporation is the Registered Native Title Prescribed Body Corporate for.	Yes
Wirrawandi Aboriginal Corporation RNTBC (WAC)	Prescribed Body Corporation (PBC) - Representative Aboriginal Corporation	The Yaburara and Mardudhunera People determined native title claim overlaps the EMBA, which the Wirrawandi Aboriginal Corporation is the which the Wirrawandi Aboriginal Corporation is the Registered Native Title Prescribed Body Corporate for.	Yes
Yawuru Native Title Holders Aboriginal Corporation RNTBC (Yawuru)	Representative Aboriginal Corporation	The Rubibi Community native title claim does not overlap the EMBA. The claim is coastally adjacent to the EMBA, for which the Yawuru Native Title Holders Aboriginal Corporation RNTBC is the Registered Native Title Body Corporate.	Yes
Yindjibarndi Aboriginal Corporation (YAC)	Prescribed Body Corporation (PBC) - Representative Aboriginal Corporation	The Ngarluma/Yindjibarndi People determined native title claim overlaps the EMBA, which the Yindjibarndi Aboriginal Corporation is the Registered Native Title Prescribed Body Corporate for.	Yes
Murujuga Aboriginal Corporation (MAC)	Representative Aboriginal Corporation	Murujuga Aboriginal Corporation (MAC) is made up of members from five traditional custodial groups: the Ngarluma, Mardudhunera, Yaburara, Yindjibarndi, and Wong-Goo-Tt-Oo peoples. MAC brings together the five groups and is the approved corporate body for the Burrup and Maitland Industrial Estates Agreement (BMIEA). MAC administers the implementation of contractual obligations under the terms of the BMIEA. MAC holds the freehold title to Murujuga National Park which overlaps the EMBA.	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
Native Title representative bodies			
Kimberley Land Council (KLC)	Native Title Representative Body	KLC is the Native Title Representative Body for the Kimberley region of Western Australia. As such, they are not a Prescribed or Registered Native Title Body Corporate but exist to assist native title claimants and holders. KLC's functions may be relevant to the proposed activity in relation to its facilitation and coordination function as a Native Title Representative Body under applicable federal legislation	Yes
Yamatji Marlpa Aboriginal Corporation (YMAC)	Native Title Representative Body	YMAC is the Native Title Representative Body for the Yamatji and Pilbara regions of Western Australia. As such, they are not a Prescribed or Registered Native Title Body Corporate but exist to assist native title claimants and holders. The NTGAC's nominated representative is YMAC. Vermilion contacted YMAC to seek guidance with respect to the appropriate Traditional Custodian group(s) to engage with respect to the proposed activity where this was not clear. YMAC's functions may be relevant to the proposed activity in relation to its facilitation and coordination function as a Native Title Representative Body under applicable federal legislation.	Yes
Historical heritage groups or organisations			
Western Australian Museum (WAM)	Manages 200 shipwreck sites of the 1,500 known to be located off the Western Australian coast.	There are known shipwrecks overlapping the EMBA which the Western Australian Museum may be responsible for.	Yes
Local government and recognised local business and community reference/liaison groups or organisations			
City of Karratha	Local government governed by the Local Government Act 1995 representing the suburbs and localities of Baynton, Baynton West, Bulgarra, Cossack, Dampier, Gap Ridge, Karratha, Karratha Industrial Estate, Jingarri, Madigan, Millars Well,	The City of Karratha's area of responsibility overlaps the EMBA.	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
	Nickol, Pegs Creek, Point Samson, Roebourne, Whim Creek, and Wickham.		
Town of Port Hedland	Local government governed by the Local Government Act 1995 representing the suburbs and localities of Cooke Point, Port Hedland, Pretty Pool, Redbank, South Hedland, Wedgefield, and Yandeyarra.	The Town of Port Hedland's area of responsibility overlaps the EMBA.	Yes
Shire of Ashburton	Local government governed by the Local Government Act 1995 representing the suburbs and localities of Onslow, Pannawonica, Paraburdoo, and Tom Price.	The Shire of Ashburton's area of responsibility overlaps the EMBA.	Yes
Shire of Exmouth	Local government governed by the Local Government Act 1995 representing the suburbs and localities of Exmouth, Learmonth, and North West Cape.	The Shire of Exmouth's area of responsibility overlaps the EMBA.	Yes
Shire of Carnarvon	Local government governed by the Local Government Act 1995 representing the suburbs and localities of Babbage Island, Brockman, Browns Range, Carnarvon, Coral Bay, East Carnarvon, Greys Plain, Ingaarda, Kingsford, Morgantown, North Plantations, South Carnarvon, and South Plantations.	The Shire of Carnarvon's area of responsibility overlaps the EMBA.	Yes
Shire of East Pilbara	Local government governed by the Local Government Act 1995 representing the suburbs and localities of Jigalong, Kiwirrkurra, Kunawarritji, Marble Bar, Newman, Nullagine, Parngurr, Punmu, and Warralong.	The Shire of East Pilbara's area of responsibility overlaps the EMBA.	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
Shire of Broome	Local government governed by the Local Government Act 1995 representing the suburbs and localities of 12 Mile, Bilingurr, Broome, Cable Beach, Cape Leveque, Coconut Well, Djugun, Lombadina, Minyirr, Morell Park, and Skuthorpe.	The Shire of Broome's area of responsibility overlaps the EMBA.	Yes
Shire of Shark Bay	Local government governed by the Local Government Act 1995 representing the suburbs and localities of Billabong, Denham, Monkey Mia, Nanga, Overlander, and Useless Loop.	The Shire of Shark Bay's area of responsibility overlaps the EMBA.	Yes
Shire of Northampton	Local government governed by the *Local Government Act 1995* representing the suburbs and localities of Ajana, Binnu, Horrocks Beach, Isseka, Kalbarri, Northampton, and Port Gregory.	The Shire of Northamptons's area of responsibility overlaps the EMBA.	Yes
Regional Development Australia (Pilbara) Karratha WA	Federal Government initiative responsible for supporting local governments and non-for-profits.	Regional Development Australia (Pilbara) Karratha WA's functions or interests may be relevant to the activity as the EMBA overlaps with its area of responsibilities	Yes
Port Hedland Chamber of Commerce and Industry	Independent not-for-profit organisation responsible for promoting the interests of its members in the business community in the town of Port Hedland and surrounding areas	The Port Hedland Chamber of Commerce and Industry's interests have the potential to be impacted by the proposed activities.	Yes
Broome Chamber of Commerce and Industry	Independent not-for-profit organisation responsible for promoting the interests of its members in the business community in the shire of Broome and surrounding areas	The Broome Chamber of Commerce and Industry's interests have the potential to be impacted by the proposed activities.	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
Onslow Chamber of Commerce and Industry	Independent not-for-profit organisation responsible for promoting the interests of its members in the business community in the town of Onslow and surrounding areas	The Onslow Chamber of Commerce and Industry's interests have the potential to be impacted by the proposed activities.	Yes
Western Australian Local Government Association (WALGA)	Independent non-for-profit organisation responsible for promoting the interests of the WA local government sector.	The WALGA's interests have the potential to be impacted by the proposed activities.	Yes
Karratha and Districts Chamber of Commerce and Industry (KDCCI)	Independent not-for-profit organisation responsible for promoting the interests of its members in the business community in the city of Karratha and surrounding areas	The Karratha and Districts Chamber of Commerce and Industry's interests have the potential to be impacted by the proposed activities.	Yes
Research institutes			
Curtin University (Centre for Marine Science and Technology)	Marine Research Organisation	There may be research being undertaken by Curtin University that intersects within the EMBA.	Yes
University of Western Australia (UWA)	Marine Research Organisation	There may be research being undertaken by University of Western Australia that intersects within the EMBA.	Yes
Commonwealth Scientific and Industrial Research Organisation (CSIRO)	Marine Research Organisation	There may be research being undertaken by the Commonwealth Scientific and Industrial Research Organisation that intersects within the EMBA.	Yes
Western Australian Marine Science Institution (WAMSI)	Marine Research Organisation	There may be research being undertaken by the Western Australian Marine Science Institution that intersects within the EMBA.	Yes
Australian Institute of Marine Science (AIMS)	Marine Research Organisation	There may be research being undertaken by Australian Institute of Marine Science that intersects within the EMBA.	Yes
Australian Marine Sciences Association (WA Branch)	Marine Research Organisation	There may be research being undertaken by Australian Marine Sciences Association that intersects within the EMBA.	Yes
Local environment and conservation groups or organisations			
Project Ningaloo	Non-government organisation	Protect Ningaloo's conservation activities have the potential to intersect with the EMBA as the EMBA overlaps North West Cape and Ningaloo Reef.	Yes

Person or Organisation	Summary of responsibilities and/or functions interests or activities	Assessment of Relevance or Rationale	Relevant Person
Australian Conservation Foundation (ACF)	Non-government organisation	Australian Conservation Foundation has a publicly available statement (or purpose), website or social media material that demonstrates that it's functions, interests or activities may be relevant to the potential risks and impacts associated with planned activities in accordance with the intended outcome of consultation.	Yes
The Conservation Council of WA (CCWA)	Non-government organisation	The Conservation Council of WA has a publicly available statement (or purpose), website or social media material that demonstrates that it's functions, interests or activities may be relevant to the potential risks and impacts associated with planned activities in accordance with the intended outcome of consultation.	Yes
Care for Hedland	Non-government organisation	Care for Hedland has a publicly available statement (or purpose), website or social media material that demonstrates that it's functions, interests or activities may be relevant to the potential risks and impacts associated with planned activities in accordance with the intended outcome of consultation.	Yes
Individual - Self Identified			
Individual 1	Self-Identified Individual	During the course of preparing the EP [Individual 1] self-identified and requested to be contacted as a potentially relevant person. VOGA was unable to get in contact with [Individual 1] after making several attempts.	No

1.3 Consultation Activities

VOGA has been consulting with relevant individuals and other interested parties for this EP since October and November 2024. This included a planned and considered approach to engaging identified relevant persons and interested parties on VOGA's proposed activities. The company undertook a broad consultation process to raise public awareness, encourage feedback and prompt respectful two-way consultation.

VOGA conveyed its planned activities through a variety of media forums that included advertisements in print media such as national, state and local newspapers, and social media platforms.

Local community centres were also contacted and asked to print and display information flyers within and adjacent to the Operational Area and EMBA to raise awareness.

VOGA's consultation webpage provided fact sheets and other publicly available materials.

Table 2: Summary of Consultation Activities

Consultation Activity	Purpose	Timing
Initial consultation (9 October 2024 – 30 November 2024)		
Consultation materials Email to identified relevant persons with a link to project information on the VOGA website, a map of the title area, and seeking their preferred method of consultation.	Raise awareness of the proposed activities and existing operations and seek input from relevant persons on their preferred method for engaging in consultation.	9 – 14 October 2024
Print media advertising Advertisement in The West Australian.	Promote awareness of proposed activities and create opportunities for relevant persons to self-identify for consultation.	27 November 2024
Website Website content and resources developed and made available: https://www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities/	Provided: • Information about VOGA's consultation obligations, approach and promoting self-identification. • Information about the proposed activities, including potential impacts and risks. • Information on the consultation process and how to self-identify. • Contact information to enable relevant persons to provide feedback. • Resources such as fact sheets, frequently asked questions and NOPSEMA guidelines.	From 26 November 2024
Consultation period (2 December 2024 – 17 January 2025)		
Consultation materials Consultation communication material included: • An email to identified relevant persons advising of the commencement of consultation.	Advising identified relevant persons of the proposed activities, the consultation period dates, and providing an opportunity for feedback on the EP.	From 2 December 2024

Consultation Activity	Purpose	Timing
• Letter to identified relevant persons advising of the commencement of consultation. • Community flyers. • Consultation Information Sheets and stakeholder-specific fact sheets for commercial fisheries and First Nations groups. • Additional targeted information about the proposed activities was provided to relevant persons in respect to their functions interests and activities.		
Consultation meetings Where indicated as the preferred consultation method, VOGA hosted in-person and virtual meetings. This included providing a presentation specific to the relevant person or organisation.	Providing information to relevant persons about the proposed activities, the consultation period dates, and providing an opportunity for feedback on the EP.	From 2 December 2024
Print media advertising Print advertisements in the following publications: • The West Australian • Koori Mail • Mid-West Times • North-West Telegraph • Broome Advertiser • Pilbara Times.	Promote awareness of the proposed activities, encourage self-identification and seek feedback from relevant persons.	From 27 November 2024
Social media advertising Geo-targeted social media advertising was deployed, aimed at communities within the EMBA.	Promote awareness of the proposed activities, consultation period and how to provide feedback on the EP.	From 28 November 2024 to 17 January 2025

1.3.1 Consultation Correspondence

VOGA used a variety of methods to correspond and consult with identified relevant persons such as email, letters, phone calls, and face-to-face and virtual meetings. Where appropriate, targeted follow-up correspondence was made to relevant persons who had not responded before the close of the feedback period. Consultation activities undertaken with relevant persons are summarised in Table 6 and consultation activities undertaken with persons or organisations VOGA assessed as not relevant but chose to consult are summarised in Table 7.

An information sheet was provided to relevant persons contacted by VOGA. The information sheet was available on VOGA's consultation website since 26 November 2024. It included an overview of the proposed activity, maps, key risks and impacts, management measures, and contact details for relevant persons to provide feedback to VOGA (see Record of Consultation, reference 1.1).

Additional targeted information was provided to relevant marine users in a commercial fishing information sheet. This included maps, key information for the commercial fishing sector regarding the EP activities, coordinates for the operational areas, an activity summary, potential impacts, an assessment of commercial fishing VOGA's impact assessment, and contact details for relevant persons to provide feedback to VOGA (see Record of Consultation, reference 1.2).

Advertising of the proposed activity

Traditional media advertising

VOGA advertised the planned activities under the proposed EP in national, regional and local newspapers selected because of their coverage area servicing potentially relevant communities and persons across Western Australia (Figure 1-20). Newspaper advertisements were published for the duration of the consultation period between 27 November 2024 and 15 January 2025 with a closing date of 17 January 2025.

Table 3 lists local newspapers used for advertising. These publications do not require subscriptions and are available directly to households within the publication's coverage area. Koori Mail, an Indigenous-focused publication, published the advertisement nationally. All communities within or adjacent to the EMBA had access to this information.

Table 3: Advertisement summary

Publication date	Advertisement type	Coverage
27 November 2024	Quarter-page print ad in The West Australian	State-wide - Western Australia
4 December 2024	Quarter-page print ad in The Koori Mail	National - focused on First Nations
4 December 2024	Quarter-page print ad in The Mid-West Times	Regional - Coral Bay, Geraldton, Meekatharra, Shark Bay, and Carnarvon
4 December 2024	Quarter-page print ad in The North-West Telegraph	Regional - Marble Bar, Newman, Nullagine, Port Hedland, and Wedgefield
10 December 2024	Quarter-page print ad in The West Australian	State-wide - Western Australia
11 December 2024	Quarter-page print ad in The Mid-West Times	Regional - Coral Bay, Geraldton, Meekatharra, Shark Bay, and Carnarvon
12 December 2024	Quarter-page print ad in The Broome Advertiser	Regional - Broome, Derby, Fitzroy Crossing, Karratha, and Kununurra
18 December 2024	Quarter-page print ad in The Koori Mail	National - focused on First Nations
18 December 2024	Quarter-page print ad in The Pilbara Times	Regional - Karratha, Dampier, Wickham, Roebourne, Point Samson, Tom Price, Pannawonica, Paraburdoo and Onslow

Publication date	Advertisement type	Coverage
18 December 2024	Quarter-page print ad in The North-West Telegraph	Regional - Marble Bar, Newman, Nullagine, Port Hedland, and Wedgefield
9 January 2025	Quarter-page print ad in The Broome Advertiser	Regional - Broome, Derby, Fitzroy Crossing, Karratha, and Kununurra
15 January 2025	Quarter-page print ad in The Pilbara Times	Regional - Karratha, Dampier, Wickham, Roebourne, Point Samson, Tom Price, Pannawonica, Paraburdoo and Onslow

Geotargeted social media campaign

Between 28 November 2024 and 17 January 2025, VOGA conducted a geotargeted social media campaign across Facebook and LinkedIn (Figure 1-17 and Table 4). The campaign focused on locations within or adjacent to the EMBA. Table 4 lists the localities identified for this campaign. The campaign reached 102,951 users on Facebook and 1,915 users on LinkedIn.

The campaign focused on bringing the proposed activity to the attention of persons who may be affected. It directed interested persons or organisations to VOGA's consultation website (Figure 1-16) which displayed further information about the proposed activities and consultation and contact details for VOGA.

Table 4: Localities and geographical reach of targeted social media advertising campaign

Platform	Geotargeted Reach	Campaign Dates	Impact
Facebook	Users located within VOGA's EMBA including: Balla Balla + 40 km, Bernier Island, Broome + 40 km, Cape Range National Park + 40 km, Carnarvon + 40 km, Coburn + 65 km, Coral Bay + 40 km, Dampier Peninsula + 40 km, Denham + 80 km, Dorre Island, Eighty Mile Beach + 40 km, Eurardy + 40 km, Exmouth + 40 km, Geraldton + 40 km, Houtman Abrolhos, Karratha + 62 km, Lagrange + 40 km, Macleod + 50 km, Mardie + 40 km, Minilya + 40 km, Mundabullangana + 40 km, Nerren Nerren + 40 km, Ningaloo, Northampton + 40 km, Onslow + 4km, Pannawonica + 40 km, Pardoo + 40 km, Port Hedland + 58 km, Sherlock + 40 km, Tamala + 40 km, Waterbank + 40 km, Wooramel + 40 km and Zuytdorp + 40 km	28 November 2024 – 17 January 2025	Reach[1]: 102,951 Frequency[2]: 4.76 Impressions[3]: 489,655 Clicks: 3,774 CTR%[4]: 0.77

[1] The number of unique users who see the advertisement

[2] The average number of times a user sees an advertisement

[3] The number of times the advertisement was seen, including multiple views from individual users

[4] Click-through rate measures the number of clicks an advertisement receives divided by the number of times the advertisement is shown.

Platform	Geotargeted Reach	Campaign Dates	Impact
LinkedIn	Users located within VOGA's EMBA including: Broome, Carnarvon, Coral Bay, Dampier, Denham, Eighty Mile Beach, Eurardy, Exmouth, Geraldton, Karratha, Lagrange, Macleod, Mardie, Minilya, Mundabullangana, Nerren Nerren, Ningaloo, Northampton, Onslow, Pannawonica, Pardoo, Port Hedland, Sherlock, Tamala, Waterbank, Wooramel and Zuytdorp.	28 November – 19 December 2024	Reach: 1,915 Average Frequency: 3.1 Impressions: 5,929 Website visits: 40 Average CTR%: 0.67

1.3.2 Community Flyer

To complement the print and social media advertising campaigns, VOGA developed a community flyer (Figure 1-18). The company asked community centres in relevant communities to display the flyer, increasing the visibility of information in regional communities adjacent to the EMBA.

Table 5: The community centres contacted to display VOGA community flyer

Town/Region	Community Centre
Geraldton	Geraldton Library
	Geraldton Regional Aboriginal Medical Service Note also have a location in Carnarvon
	Aboriginal Family Legal Services
	Aboriginal Legal Services of Western Australia
Karratha	Dampier Community Hub
	Frank Butler Community Centre
	Karratha Library
	Dampier Library
	Wickham Library
	Roebourne Library
	Karratha and Districts Chamber of Commerce and Industry
	Mawarnkarra Health Service – located in Roebourne
	Pilbara Community Legal Service
	Aboriginal Legal Services of Western Australia
	Karratha Business Centre
	Pilbara Development Commission
	Karratha Family Centre
	Pam Buchanan Family Centre

Town/Region	Community Centre
	Karratha Leisureplex
	Roebourne Aquatic Centre
	Wickham Recreation Precinct
Northampton	Northampton Library
	Kalbarri Library / Allen Centre
Shark Bay	Shark Bay Community Resource Centre
	Shark Bay Library
East Pilbara	Newman Library
	Marble Bar Library
	Nullagine Library
	The Square
	Newman Putukurnu Aboriginal Medical Service
	Newman Newman Recreation Centre
	Tom Price Nintirri Centre
	Tom Price Community Recreation Centre
	Tom Price Civic Centre
Ashburton	Libraries in Onslow, Pannawonica, Paraburdoo and Tom Price
Port Hedland	Port Hedland Community Centre
	Port Hedland Library
	South Hedland Library
	Port Hedland Chamber of Commerce
Carnarvon	Carnarvon Civic Centre
	Geraldton Regional Aboriginal Medical Service Note same contact details as the Geraldton location
	Carnarvon Medical Service Aboriginal Corporation
	Gwoonwardu Mia Cultural Centre
	Aboriginal Legal Services of Western Australia

Town/Region	Community Centre
	Aboriginal Family Legal Services
	Carnarvon Library
Exmouth	Ningaloo Centre (includes the library)
Broome	Broome Public Library
	Broome Chamber of Commerce and Industry
	Aboriginal Family Legal Services
	Broome Regional Aboriginal Medical Service
	Kimberley Aboriginal Medical Services
	Bidyandanga Aboriginal Community La Grange Inc.
	Nirrumbuk Aboriginal Corporation
	Nirrumbuk Environmental Health and Services Pty Ltd
	Broome Aboriginal Short Stay Accommodation
	Mamabulanjin Aboriginal Corporation
Derby	Derby Public Library
	Derby Shire Council
	Derby Aboriginal Health Service Council
	Winun Ngari Aboriginal Corporation
	Mowanjum Aboriginal Art & Culture Centre
	Derby Civic Centre
Onslow	Onslow Chamber of Commerce and Industry

1.3.3 Consultation with First Nations people and organisations

Additional consultation activities were undertaken with relevant Traditional Custodians and First Nations people and organisations. These activities were specifically developed to encourage effective engagement and ensure information was provided in a form that was accessible and appropriate.

Consultation undertaken specifically with First Nations people and organisations for this EP included:

- Direct correspondence and engagement with nominated representative bodies through the contact list on the ORIC website. To encourage respectful, two-way dialogue VOGA requested advice on how they would like to be engaged. This resulted in meetings with representatives, requests for resourcing to enable consultation, providing information on the proposed activities, and exchanging written correspondence.
- A Summary Information Sheet was developed to ensure the content was appropriate and accessible for the intended recipients and provided to them (Figure 1-19).

- Consultation meetings were held between First Nations groups, VOGA representatives, and advisers with experience in First Nations community engagement. These meetings were held based on the principles of a co-designed approach and that two-way communication was encouraged to ensure information was shared effectively. This included proposing a mutually agreed agenda, visual aids, emphasis on risks and impacts, opportunity for feedback and questions, discussion about ongoing relationship development, and meeting all costs such as sitting fees, travel and other support required.

- VOGA researched relevant First Nations groups and representative bodies to better understand their values and interests. This included desktop research and reviewing precedent engagement by other titleholders and resulted in the development of special interest material that could provide relevant information to the group's functions, interests and activities. This collateral was used during meetings.

- Ongoing efforts were made to engage with First Nations groups to develop relationships via different channels and methods such as email, phone calls, text messages, and by seeking alternative appropriate contacts.

- VOGA also ran a geo-targeted social media campaign (Table 4) and print media advertising campaign (Table 3), reaching communities adjacent to the EMBA of the proposed activities. The campaign was wide-reaching and brought the proposed activities to the attention and was developed with accessible language appropriate for Indigenous audiences. The campaigns directed any interested parties to VOGA's consultation website (Figure 1-16) where further information, contact details and resources were made available.

1.3.4 Consultation Material

Included below are copies of the consultation material deployed during consultation activities and VOGA's public awareness campaign.

Figure 1-2: Wandoo Field Exploration Drilling Environment Plan Information Sheet

VERMILION ENERGY

INFORMATION SHEET

Wandoo Field

Exploration Drilling Environment Plan

December 2024

About Vermilion Energy

Vermilion Energy is an international energy producer with a 30-year track record. It has operations in North America, Europe and Australia.

Vermilion Oil and Gas Australia (Vermilion) is a subsidiary of Vermilion Energy and has operated in Australia for over 20 years. Our Australian operations focus on exploring for and developing oil at the Wandoo Field off the shore of Western Australia.

About Wandoo Field

The Wandoo Field was discovered in 1991 and the extraction of oil started in 1993. Vermilion has been the operator since November 2005 and the sole titleholder since 2007.

The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island (**Figure 1**). It operates at a water depth in the range from 50m-60m.

The Wandoo Facility operates under existing accepted Environmental Plans in place for production and well construction.

Operational Areas

Operational Areas have been defined as a subset of WA-14-L, to encompass the exploration prospects. Co-ordinates of the exploration prospects are listed in **Table 2**, with Operational Areas of a 4 x 4km square centred around these geographical co-ordinates (see **Figure 2**).

Activity overview

Vermilion currently operates the Wandoo Facility within the production licence area WA-14-L. Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan (EP).

The activity duration is expected to be between approximately 15 to 20 days of continuous drilling operations for each well drilled. The expected duration is a forecast and is subject to change based on Mobile Offshore Drilling Unit (MODU) availability or adverse weather conditions. A summary of the activity is provided in **Table 1.**

Communications with mariners

A temporary 500m safety exclusion zone will apply around the drilling rig. Commercial fishers and other marine users are permitted to use the Operational Areas but should take care around the operations by adhering to standard navigation rules and remain clear of the safety exclusion zone.

Marine notices will be issued prior to activity commencement to alert vessels which may be operating in waters nearby.

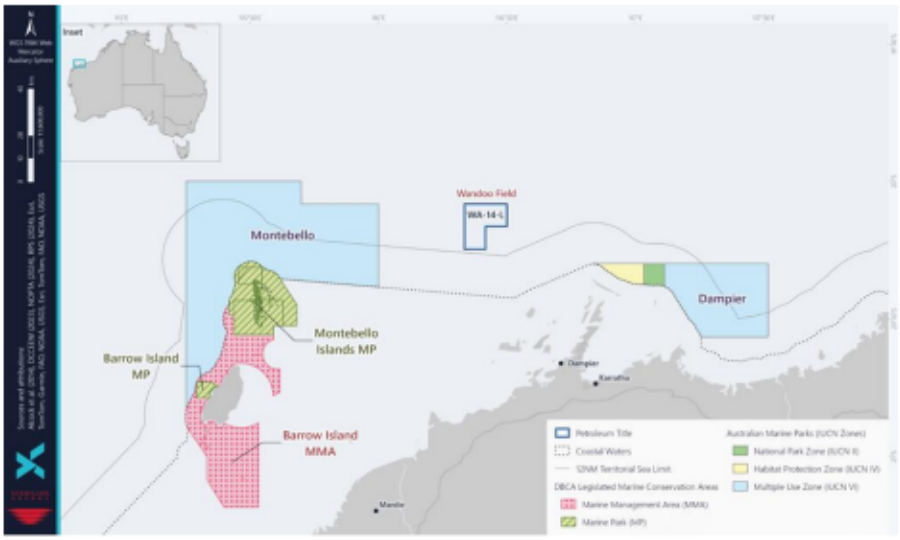


Figure 1. Location of the Wandoo Field

Activity summary

Table 1. Activity summary

Production licence area	WA-14-L
Approximate duration and timing of activities	• 15-20 days (per well/campaign). • The first well is proposed to be drilled in Q4 2025 – Q1/Q2 2026, pending regulatory approval and rig availability. • The timing of subsequent activities has not been finalised. The Wandoo Field Exploration Drilling EP assumes the activities may be undertaken at any time of year over the five year period following acceptance of the EP.
Approximate water depth	50–60m
Key activities	The approach to exploration drilling is summarised in the following key steps: • Using an approved transit route specialist anchor handling vessels will manoeuvre the drilling rig into place. • The drilling rig will be positioned at sites determined as suitable by the seabed assessments. • Surface hole section will be drilled and cased, and then a riser and Blow-out Preventer (BOP) to prevent release of hydrocarbons installed. • The well would then be drilled to reach the reservoir. • Once the exploration wells have been drilled and evaluated, they will be Plugged and Abandoned (P&A) so hydrocarbons cannot be released, and all equipment removed from the seabed.
Vessels	• One jack-up MODU (drilling rig). • One to four support vessels (typically two for drilling rig support) will be involved in the activity. • Vessel details are not known at this time.
Remotely operated vehicle (ROV)	A light work-class ROV will be available on location to be used to support drilling rig operations. ROV activities may include survey and monitoring operations.
Helicopters	Helicopters will be used for crew changes, critical equipment supply, surveillance and emergency response uses.
Drilling muds and cuttings	Vermilion drilling operations will use only water-based fluids called 'muds' to lubricate and stabilise the wellbores in each section and remove drilling cuttings. Drill cuttings are rock chips from the sedimentary layers that emerge from the drilling process and range from very fine to pebble sized. Water-based muds are recycled as much as possible during the drilling process. The cuttings will be processed on the drilling rig before they are discharged overboard, where they will settle rapidly on the seafloor around the well site. This is standard industry practice in Australia. Marine mammals and fish may transit through these areas but will usually avoid the temporary disturbance. Any exposure to suspended sediment before it settles on the seabed will be highly localised and temporary due to high dilution and fast dispersal in the water column.
Operational area and exclusion zones	A temporary 500m safety exclusion zone will be in place around the drilling rig to manage vessel movements. No restrictions to other vessels within the Operational Area apart from being advised to take care during the drilling activities.
Description of the environment	The Operational Area is located within the Northwest Shelf provincial bioregion (based on the Integrated Marine and Coastal Regionalisation). Proximity to key features include: *Aboriginal cultural heritage* • There are no registered Aboriginal cultural heritage sites within the Operational Area. *Biologically important areas (BIAs)* The following BIAs intersect the Operational Area: • Wedge-tailed shearwater – Reproduction • Humpback whale – Migration • Flatback turtle – Reproduction • Whale shark – Foraging

	Heritage There are no World Heritage or National Heritage Properties within the Operational Area. The nearest heritage properties are: • Ningaloo Coast (World Heritage) ~250km from the Operational Area • Dampier Archipelago (National Heritage) ~35km from the Operational Area *Commercial fishing* The following Commonwealth managed fisheries have a defined management area that overlaps the Operational Area: • Southern Bluefin Tuna Fishery • Western Skipjack Tuna Fishery • Western Tuna and Billfish Fishery The following State-managed fisheries have a defined management area that overlaps the Operational Area: • Abalone Managed Fishery • Hermit Crab Fishery • Mackerel Managed Fishery • Marine Aquarium Managed Fishery • Nickol Bay Prawn Fishery • Onslow Prawn Limited Entry Fishery • Pilbara Crab Managed Fishery • Pilbara Line Fishery • Pilbara Fish Trawl Interim Managed Fishery • Pilbara Trap Managed Fishery • South-west Coast Salmon Fishery • Specimen Shell Managed Fishery • West Coast Deep Sea Crustacean Managed Fishery • Western Australian Sea Cucumber Fishery *Key ecological features (KEFs)* There are no KEFs within the Operational Area. The nearest KEFs are: • Glomar Shoals ~40km to the north-north-east of the Operational Area. • Ancient coastline at 125m depth contour ~56km to the north of the Operational Area. • Continental Slope Demersal Fish Communities ~118km north-west of the Operational Area. *Oil and gas operations* Petroleum activities within the vicinity of the Operational Area: • Reindeer platform ~14km from the Operational Area • Stag platform ~13km from the Operational Area • Scarborough export pipeline ~3km from the Operational Area • TL1 and TL2 export pipelines ~500m and ~18km from the Operational Area *Shipping* • The Operational Area is approximately 31km from the northbound shipping fairway from Dampier. *Protected areas* No Australian Marine Parks (AMPs) are within the Operational Area. The nearest AMPs are: • Montebello AMP ~37km to the west of the Operational Area • Dampier AMP ~47km to the south-east of the Operational Area • Montebello Islands Marine Part (State) ~75km to the west-south-west of the Operational Area • Barrow Island Marine Management Area (State) ~89km to the west-south-west of the Operational Area *Tourism, towns and communities* • The town of Dampier is located 80km south-south-east of the Operational Area.

Table 2 Prospect locations

Prospect names	Latitude	Longitude
Mottlecah	20° 8' 32.7" S	116° 23' 7.4" E
Jinjulu	20° 10' 44.6" S	116° 21' 21.4" E
Kullingal	20° 10' 16.2" S	116° 23' 3.2" E
North of Wandoo 1	20° 6' 5.2" S	116° 25' 0.6" E
North of Wandoo 2	20° 5" 16.2" S	116° 25' 46.6" E
North Jurassic	20° 5' 57.5" S	116° 23' 53.2" E
North West Jurassic	20° 5' 57.9" S	116° 21' 26.5" E

Environment that may be affected

The environment that may be affected (EMBA) is a mathematically modelled area of the largest possible spatial extent where the activities could potentially have an environmental consequence. The broadest extent of the model takes into consideration planned and unplanned activities.

For the Wandoo Field Exploration Drilling EP, the EMBA has been developed combining numerous modelling outputs, based on a release of hydrocarbons to the environment from a loss of well containment. This scenario is extremely unlikely to occur. The EMBA is shown in **Figure 2**

The EMBA does not represent the extent of the predicted impact of a release of hydrocarbons. Rather, the EMBA represents the merged area of many possible paths that a hydrocarbon release could travel, depending on factors including the weather and ocean conditions at the time of the release.

This means that in the unlikely event that a hydrocarbon release does occur, the whole EMBA will not be affected. Only a minimal, specific part of the EMBA will be affected and that portion would only be known at the time of the release.

Assessment

Vermilion has undertaken an assessment of the potential impacts and risks to the environment as well as potential risks to relevant persons arising from the planned activities and unplanned events. This assessment considers the timing, duration and location of the activities. A number of mitigation and management measures will be implemented and are summarised in **Table 3**. Further details will be provided in the Wandoo Field Exploration Drilling EP.

In preparing the EP, Vermilion's intent is to minimise environmental, social and cultural risks and impacts associated with the proposed activities, and Vermilion seeks your feedback to inform our decision making.

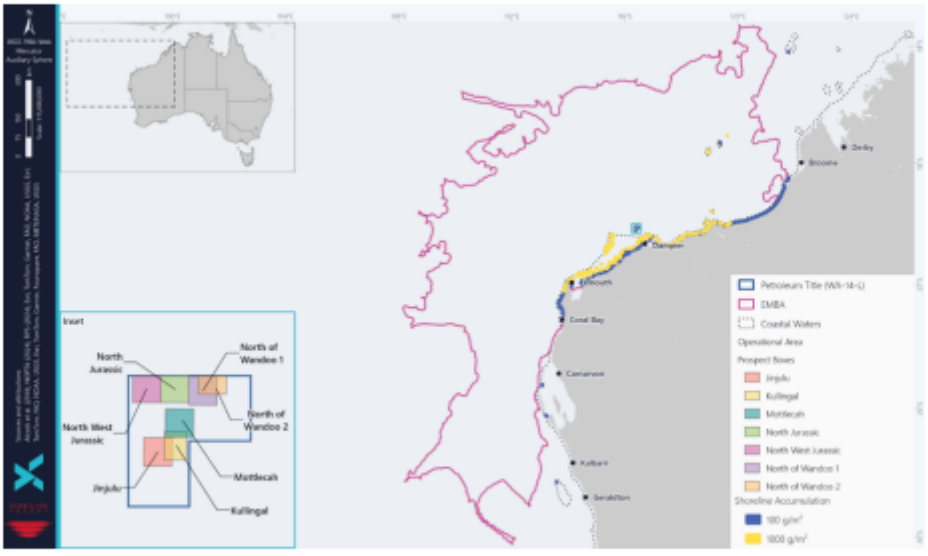


Figure 2. Environment that may be affected

Mitigation and management measures

Vermilion has undertaken an assessment to identify potential impacts and risks to the environment arising from the activity. A number of mitigation and management measures for the activity are outlined in **Table 3.** Further details will be provided in the Wandoo Field Exploration Drilling EP.

Table 3. Summary of key risks and/or impacts and preliminary management measures for the activity

Potential impact/risk	Source of potential impact/risk	Description of potential impact/risk	Preliminary draft mitigation and/or management measure
Planned activities (routine and non-routine)			
Physical presence: interaction with other marine users	Drilling rig and support vessels	Potential displacement of commercial fishing activities and commercial shipping vessels.	Drilling rig and vessel communication equipment will be maintained to allow for communication with commercial and recreational vessels. The Australian Hydrographic Office (AHO) and Australian Maritime Safety Authority (AMSA) will be notified prior to activities so appropriate marine notices can be issued. The drilling rig will have a restricted zone of 500m.
Physical presence: disturbance to seabed	Drilling rig, support vessels and ROV	Localised increase in turbidity. Potential impacts to benthic habitat and communities.	A Rig Move Plan will be prepared in accordance with the drilling contractor's Marine Operations Manual.
Routine acoustic emissions: generation of noise	Drilling rig, support vessels and Helicopters Vertical seismic profiling	Potential temporary or permanent injury or behavioural change in marine fauna.	Drilling rig and vessel engines and power equipment will be maintained to optimise smooth running. Vessels operating in the Operational Areas must adhere to Part 8 of Environment Protection and Biodiversity Conservation (EPBC) Regulation 2000 to minimise exposure of marine fauna to noise impacts.
Routine and non-routine discharges	Drilling rig and support vessels	Potential localised eutrophication of the water column and localised adverse effect to marine species.	Discharges such as deck drainage, bilge, garbage, food waste and sewage will be treated in accordance with: • MARPOL 73/78 Annex I and AMSA Marine Order 91. • MARPOL 73/78 Annex V. • MARPOL 73/78 Annex IV and AMSA Marine Order 96. • AMSA Marine Order 95.
Routine light emissions	Drilling rig, support vessels and ROV	Potential interference with or disturbance of marine fauna.	No controls identified as vessel lighting is specified for safe working practices.
Routine and non-routine discharges of drill cuttings and drilling fluids and cement	Drilling rig and plug and abandon activities	Potential toxic effects to marine species, localised reduction in water quality.	Drilling fluids and cement components will be selected using the chemical assessment process. Drilling fluids will be processed using a solids control system to enable reuse of fluids and minimise the volume of fluids being discharged. Only water-based drilling muds will be used.
Routine and non-routine atmospheric and greenhouse gas emissions	Drilling rig and support vessels	Potential temporary decrease in local air quality.	The drilling rig and vessels, and fuels used will comply with Regulation 14 of MARPOL 73/78 Annex IV and AMSA Marine Order 97. Power generation systems, ancillary diesel engines and refrigeration systems will be maintained via preventative maintenance systems.

Unplanned events (accidents/incidents)			
Introduction and establishment of invasive marine species	Drilling rig and support vessels	Potential reduction in native species abundance due to competition or predation.	Drilling rig and vessels will comply with: • Australian Ballast Water Management Requirements consistent with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Management Convention). • Annex 1 of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships. • National Biofouling Guidelines for the Petroleum Production and Exploration Industry and IMO Guidelines for the control and management of a ship's biofouling to minimise the transfer of invasive aquatic species.
Vessel collision or disturbance of fauna	Support vessels	Potential injury of marine fauna.	Vessels contracted by Vermilion operating in the Operational Areas must have procedures that adhere to Part 8 of EPBC Regulation 2000 to minimise exposure of marine fauna.
Dropped objects	Drilling rig and support vessels	Decrease in water quality and potential toxic effects to marine species. Potential injury of marine fauna.	Drilling rig work procedures for lifts, bulk transfers and cargo loading will require: • the security of loads to be checked prior to commencing lifts. • loads to be covered if there is a risk of losing loose materials. • lifting operations to consider weather and sea state. Drilling rig inductions will include control measures and training for crew in dropped object prevention.
Accidental discharge materials and waste	Drilling rig and support vessels	Potential pollution and contamination of the marine environment. Decrease in water quality Injury of marine fauna.	Drilling rig and vessels' procedures are compliant with MARPOL Convention Annex V and Marine Order 95.
Minor spills	Drilling rig and support vessels	Decrease in water quality and potential toxic effects to marine species.	Intermediate bulk containers are transferred to/from vessels using a lifting cradle or are containerised. Cranes and lifting equipment are certified.
Loss of containment – marine diesel oil (MDO)	Support vessels	Decrease in water quality. Potential oiling of marine fauna and toxic effects to marine species.	AHO and AMSA will be notified in advance of drilling rig movements. Drilling rig and vessels will have navigational lights. Vessels will have dynamic positioning capability and trials will be performed as required. Dry break coupling on refuelling hose to minimise spill due to vessel loss of position.
Loss of well containment	Drilling rig	Decrease in water quality. Potential oiling of marine fauna and toxic effects to marine species.	Wells are designed and components are manufactured in compliance with the Vermilion Well Construction Standards Manual and relevant API or ISO specifications. Vermilion Drilling Supervisors, Completions Supervisors and Drilling Superintendents are required to hold current Well Control certification. BOPs are tested at regular intervals in accordance with API standard 53.
Hydrocarbon spill response activities	Spill response	Potential toxic effects to marine fauna from dispersants, disturbance	Vermilion maintains contracts with oil spill response organisations, operational and scientific

		to benthic habitat, scouring of sediments, and decrease in water quality.	monitoring providers, and logistics operators for support in the event of a hydrocarbon spill. Vermilion tests response arrangements annually to ensure preparedness for unplanned hydrocarbon spills. Implementation of response strategies will be undertaken as per the NOPSEMA-accepted Oil Pollution Emergency Plan (OPEP) and in consultation with or under direction of the Commonwealth or State Control Agency.

Consultation

Consultation provides Vermilion with an opportunity to receive feedback from authorities, persons and organisations whose functions, interests or activities may be affected by proposed petroleum activities. This feedback helps us to refine or change the management measures we are planning to address potential activity impacts and risks. Vermilion's objective for the proposed activities is to ensure the activity is carried out in a manner that is consistent with the principles of Ecologically Sustainable Development (ESD) and reduce environmental impacts and risks to a level that is As Low As Reasonably Practicable (ALARP) and acceptable over the life of the activity.

Consultation also helps us to identify values and sensitivities where information is not publicly available, such as spiritual and cultural connection to land and sea country, as well as first-hand feedback on commercial and recreational fishing, tourism and local community activities and interests.

Feedback

If you consider you may be a relevant person, please contact us as soon as possible if you require any further information or if you think you are not on our consultation list.

We are asking for relevant persons to provide feedback by **17 January 2025.**

Feedback provided by relevant persons will be considered in an addendum to the Wandoo Field Exploration Drilling EP and through the life of the activity. Feedback from relevant persons will be included in the EP submitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment.

Please let us know if you would like your personal/organisational details or any part of your feedback to remain private and we will ensure this remains confidential to NOPSEMA.

Contact us

Website: www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

Email: abu.consultation@vermilionenergy.com

Phone: (08) 9217 5858

To visit our website, scan the QR code

Figure 1-3: Commercial fisher information sheet

VERMILION ENERGY

COMMERCIAL FISHER INFORMATION SHEET

Wandoo Field

Exploration Drilling Environment Plan

December 2024

Information for commercial fishers

Information overview

This Commercial Fisher Information Sheet provides supplementary information to the Vermilion Oil and Gas Australia (Vermilion) general information sheet about the proposed exploration drilling in the Wandoo Field.

This Information Sheet provides supplementary information for the needs of commercial fishers who may be active in the Operational Area.

It summarises the ongoing assessment of potential impacts and risks to the commercial fishing industry and provides information for the needs of commercial fishers, who may be active in the Operational Area, about the proposed activities.

Activity overview

Vermilion currently operates the Wandoo Facility within the production licence area WA-14-L. Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan (EP).

The activity duration is expected to be between approximately 15 to 20 days of continuous drilling operations for each well drilled. The expected duration is a forecast and is subject to change based on mobile offshore drilling unit (MODU) availability or adverse weather conditions.

About Vermilion Energy

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Vermilion is a subsidiary of Vermilion Energy and has operated in Australia for over 20 years. Our Australian operations focus on exploring for and developing oil at the Wandoo Field off the shore of Western Australia.

About Wandoo Field

The Wandoo Field was discovered in 1991 and the extraction of oil started in 1993. Vermilion has been the operator of Wandoo Field since November 2005 and the sole titleholder since 2007.

The Wandoo Facility operates under existing accepted EPs in place for production and well construction.

Key information

- **Vessels:** One to four support vessels (typically two for drilling rig support) will be involved in the drilling activities. Vessel details are not known at this time.
- **Location:** The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island (**Figure 1**).
- **Operational Areas:** Commercial fishers and other marine users are permitted to use the Operational Areas but should take care around operations by adhering to standard navigation rules.
- **Timing and duration:** The first well is proposed to be drilled in Q4 2025 – Q1/Q2 2026, pending regulatory approval and rig availability. The activity duration is expected to be between approximately 15 to 20 days of continuous well operations for each well drilled.
- **Exclusion zones:** A temporary 500m safety exclusion zone will apply around the MODU to manage vessel movements. There will be no other restrictions to other vessels within the Operational Area.
- **Notifications:** Marine notices will be issued prior to activity commencement to alert vessels which may be operating in waters nearby.

Wandoo Field location

The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island (**Figure 1**). It operates at a water depth in the range from 50m-60m.

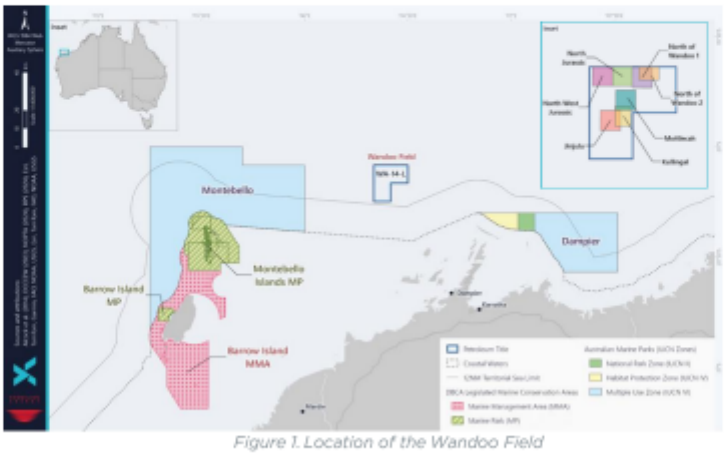

Figure 1. Location of the Wandoo Field

Operational Areas

Operational Areas have been defined as a subset of Permit WA-14-L, including an approximate 4 x 4km boundary surrounding each exploration prospect. Operational Areas are shown in the **Figure 1** inset and co-ordinates provided in **Table 1**.

Table 1. Coordinates of the Wandoo Field Operational Areas

Prospect names / Operational Areas	Corner	Latitude	Longitude
North West Jurassic	A	20° 6' 59.33968" S	116° 20' 26.64720" E
North West Jurassic	B	20° 6' 58.94753" S	116° 22' 45.82891" E
North West Jurassic	C	20° 4' 57.34916" S	116° 22' 45.83320" E
North West Jurassic	D	20° 4' 57.29532" S	116° 20' 27.15801" E
Kullingal	A	20° 11' 21.22383" S	116° 23' 2.89793" E
Kullingal	B	20° 11' 21.96433" S	116° 24' 51.85846" E
Kullingal	C	20° 9' 11.44104" S	116° 24' 50.78617" E
Kullingal	D	20° 9' 11.10559" S	116° 23' 3.40865" E
Mottlecah	A	20° 9' 37.70610" S	116° 23' 7.14156" E
Mottlecah	B	20° 9' 38.17225" S	116° 25' 24.93474" E
Mottlecah	C	20° 7' 28.05266" S	116° 25' 25.41201" E
Mottlecah	D	20° 7' 27.58741" S	116° 23' 7.65052" E
Jinjulu	A	20° 11' 49.62039" S	116° 21' 21.12177" E
Jinjulu	B	20° 11' 50.11044" S	116° 23' 38.94639" E
Jinjulu	C	20° 9' 39.99207" S	116° 23' 39.44902" E
Jinjulu	D	20° 9' 39.50297" S	116° 21' 21.65616" E
North of Wandoo 1	A	20° 7' 10.34410" S	116° 25' 0.37851" E
North of Wandoo 1	B	20° 7' 10.78478" S	116° 27' 18.13657" E
North of Wandoo 1	C	20° 5' 0.66387" S	116° 27' 18.58681" E
North of Wandoo 1	D	20° 5' 0.22405" S	116° 25' 0.86036" E
North of Wandoo 2	A	20° 6' 21.22356" S	116° 25' 46.34433" E
North of Wandoo 2	B	20° 6' 21.65399" S	116° 28' 4.09075" E
North of Wandoo 2	C	20° 4' 57.17177" S	116° 28' 4.37611" E
North of Wandoo 2	D	20° 4' 57.56346" S	116° 25' 47.51389" E
North Jurassic	A	20° 6' 59.39506" S	116° 22' 45.52891" E
North Jurassic	B	20° 6' 59.85576" S	116° 25' 0.50452" E
North Jurassic	C	20° 4' 58.19869" S	116° 25' 0.95531" E
North Jurassic	D	20° 4' 57.60294" S	116° 22' 46.40135" E

Notes: A – southwest corner; B – southeast corner; C – northwest corner; D – northeast corner.

Activity summary

Table 2 Activity summary

Production licence area	WA-14-L
Approximate duration and timing of activities	• 15-20 days (per well/campaign). • The first well is proposed to be drilled in Q4 2025 – Q1/Q2 2026, pending regulatory approval and rig availability. • The timing of subsequent activities has not been finalised. The Wandoo Field Exploration Drilling EP assumes the activities may be undertaken at any time of year over the five year period following acceptance of the EP.
Approximate water depth	50–60m
Key activities	The approach to exploration drilling is summarised in the following key steps: • Using an approved transit route specialist anchor handling vessels will manoeuvre the drilling rig into place. • The drilling rig will be positioned at sites determined as suitable by the seabed assessments. • Surface hole section will be drilled and cased, and then a riser and blow-out preventer to prevent release of hydrocarbons installed. • The well would then be drilled to reach the reservoir. • Once the exploration wells have been drilled and evaluated, they will be plugged and abandoned so hydrocarbons cannot be released, and all equipment removed from the seabed.
Vessels	• One jack-up MODU (drilling rig). • One to four support vessels (typically two for drilling rig support) will be involved in the activity. • Vessel details are not known at this time.
Remotely operated vehicle (ROV)	A light work-class ROV will be available on location to be used to support drilling rig operations. ROV activities may include survey and monitoring operations.
Helicopters	Helicopters will be used for crew changes, critical equipment supply, surveillance and emergency response uses.
Drilling muds and cuttings	Vermilion drilling operations will use only water-based fluids called 'muds' to lubricate and stabilise the wellbores in each section and remove drilling cuttings. Drill cuttings are rock chips from the sedimentary layers that emerge from the drilling process and range from very fine to pebble sized. Water-based muds are recycled as much as possible during the drilling process. The cuttings will be processed on the drilling rig before they are discharged overboard, where they will settle rapidly on the seafloor around the well site. This is standard industry practice in Australia. Marine mammals and fish may transit through these areas but will usually avoid the temporary disturbance. Any exposure to suspended sediment before it settles on the seabed will be highly localised and temporary due to high dilution and fast dispersal in the water column.
Operational Area and exclusion zones	A temporary 500m safety exclusion zone will be in place around the drilling rig to manage vessel movements. No restrictions to other vessels within the Operational Area apart from being advised to take care during the drilling activities.
Communication with fishers	Marine notices will be issued prior to activity commencement to alert vessels which may be operating in waters nearby. Coordinates will be provided to stakeholders 30 days before the commencement of any activities.

Assessment of commercial fishing, potential effects and impacts

Commonwealth managed fisheries

There are three Commonwealth managed commercial fisheries that have a defined management area overlapping the Operational Areas (**Table 3**).

Table 3 Commonwealth managed fisheries

Commonwealth managed fisheries	Summary of fishery in relation to Operational Areas	Assessment of potential impacts
Southern Bluefin Tuna Fishery	The Southern Bluefin Tuna Fishery operates around Australia and extends to the high seas fishing zone (out to 200nm from the coast). The fishery targets southern bluefin tuna only. Fishing activity is focused in southern Australian waters with no activity expected across the Operational Areas.	No impact to the fishery expected.
Western Skipjack Tuna Fishery	The Western Skipjack Tuna Fishery extends west from Cape York Peninsula and around Australia to the South Australian/Victorian border, out to the edge of the Australian Fishing Zone. Little fishing activity has been undertaken in this fishery since 2008. No fishing activity associated with this fishery is expected to occur within the Operational Areas.	No impact to the fishery expected.
Western Tuna and Billfish Fishery	The Western Tuna and Billfish Fishery management area extends over a large area westward from Cape York Peninsula off Queensland, around the west coast of Western Australia and eastward, across the Great Australian Bight to 141°E at the South Australian/Victorian border. The fishery has operated at low levels of effort since the early 2000's. Target species include albacore, bigeye tuna, yellowfin tuna, swordfish and striped marlin. No fishing activity associated with this fishery is expected to occur within the Operational Areas.	No impact to the fishery expected.

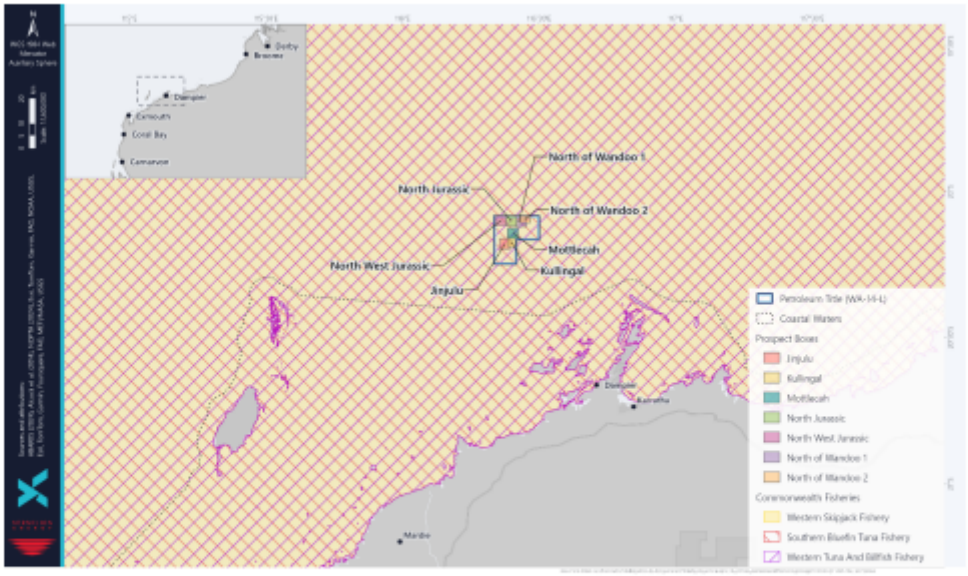

Figure 2. Commonwealth managed fisheries

State managed fisheries

State managed commercial fisheries that have historical fishing activity intersecting the Operational Area within the last 10 years include:

- Hermit Crab Fishery
- Mackerel Managed Fishery
- Marine Aquarium Managed Fishery
- Nickol Bay Prawn Fishery
- Onslow Prawn Limited Entry Fishery
- Pilbara Crab Managed Fishery
- Pilbara Line Fishery
- Pilbara Fish Trawl Interim Managed Fishery
- Pilbara Trap Managed Fishery
- Specimen Shell Managed Fishery, and
- Western Australian Sea Cucumber Fishery.

Figure 3 depicts the state managed commercial fisheries that had three or more vessels (per year) active within the Operational Areas.

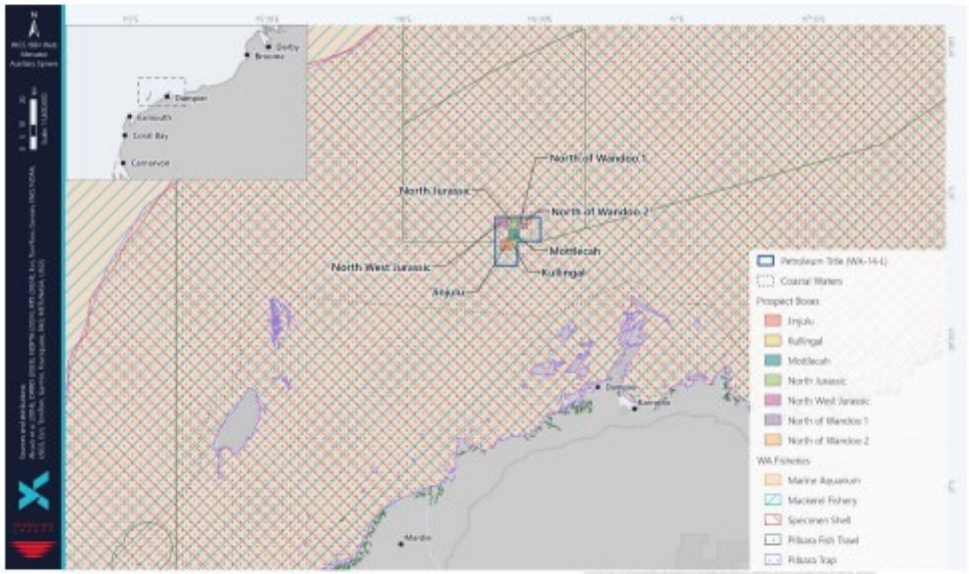

Figure 3. State managed fisheries

Vermilion impact assessment

Vermilion has undertaken an assessment to identify potential impacts and risks to commercial fishers from the activity. A number of mitigation and management measures for the activity are outlined in **Table 4.** Further details will be provided in the Wandoo Field Exploration Drilling EP.

Table 4. Potential interactions with commercial fishing

Potential impact	Description of potential impact/risk	Proposed control measures
Interference with commercial fishing activities	Potential displacement of commercial fishing activities.	• Drilling rig and vessel communication equipment will be maintained to allow for communication with commercial fishing vessels. • The Australian Hydrographic Office (AHO) and Australian Maritime Safety Authority (AMSA) will be notified prior to activities so appropriate marine notices can be issued. • The drilling rig will have an exclusion zone of 500m.
Introduction and establishment of invasive marine species	Potential reduction in commercial species abundance due to competition or predation.	The drilling rig and vessels will comply with: • Australian Ballast Water Management Requirements consistent with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Management Convention). • Annex 1 of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships. • National Biofouling Guidelines for the Petroleum Production and Exploration Industry and IMO Guidelines for the control and management of a ship's biofouling to minimise the transfer of invasive aquatic species.
Vessel collision	Decrease in water quality. Potential toxic effects to commercial species.	• AHO and AMSA will be notified in advance of vessel activities. • The drilling rig and vessels will have navigational lights. • The vessels will have dynamic positioning capability. • The drilling rig and vessels will be equipped and crewed in accordance with the *Navigation Act 2012* and Marine Orders. • Vessels will have a dedicated Ship Oil Pollution Prevention Plan (SOPEP). • An Oil Pollution Emergency Plan (OPEP) will be prepared and implemented as required.

Consultation

Consultation provides Vermilion with an opportunity to receive feedback from authorities, persons and organisations whose functions, interests or activities may be affected by proposed petroleum activities. This feedback helps us to refine or change the management measures we are planning to address potential activity impacts and risks. Vermilion's objective for the proposed activities is to ensure the activity is carried out in a manner that is consistent with the principles of Ecologically Sustainable Development (ESD) and reduce environmental impacts and risks to a level that is As Low As Reasonably Practicable (ALARP) and acceptable over the life of the activity.

Consultation also helps us to identify values and sensitivities where information is not publicly available, such as spiritual and cultural connection to land and sea country, as well as first-hand feedback on commercial and recreational fishing, tourism and local community activities and interests.

Feedback

Vermilion is committed to working together with the commercial fishing industry so that we can all proceed with business in a safe and efficient manner.

If you consider you may be a relevant person, please contact us as soon as possible if you require any further information or if you think you are not on our consultation list.

We are asking for relevant persons to provide feedback by **17 January 2025.**

Feedback provided by relevant persons will be considered in an addendum to the Wandoo Field Exploration Drilling EP and through the life of the activity. Feedback from relevant persons will be included in the EP submitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment.

Please let us know if you would like your personal/organisational details or any part of your feedback to remain private and we will ensure this remains confidential to NOPSEMA.

Contact us

Website: www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

Email: abu.consultation@vermilionenergy.com

Phone: (08) 9217 5858

To visit our website, scan the QR code

Figure 1-4: The West Australian – 27 November 2024

50 • WEDNESDAY, NOVEMBER 27, 2024

CLASSIFIEDS THE WEST AUSTRALIAN

PUBLIC NOTICES

Government of Western Australia
Public Transport Authority

EXTRACT FROM ORDERS FOR TAKING LAND

LAND ADMINISTRATION ACT 1997 section 177(5)(a)

The land/interests in land in the schedule below has/have been taken by order(s) of the Minister for Transport in accordance with sections 177 and 178 of the *Land Administration Act 1997*. The order(s) has/have been registered by the Registrar of Titles on 20 November 2024, with registration number(s) stated in the schedule. Extract(s) of the order(s) follows:

Location of Land	Designation	Land Description	Reg. No. of Order	Job No. Reference
City of Cockburn	Public Transport Facilities	Lot 5004 on Deposited Plan 428098	Q219625	PTA0188/12

A copy of the order can be obtained from Landgate, 1 Midland Square, Midland, WA or www.landgate.wa.gov.au.

Further details can be obtained from Kim Walliss, Land Integration Manager, Office of Major Transport Infrastructure Delivery, 34 Stirling Street Perth, WA, 6000 or by telephoning (08) 9326 5870.

Dated this 21st Day of November 2024

Hon Rita Saffioti MLA

MINISTER FOR TRANSPORT

PTA_24238

Wandoo Field Environment Plans Consultation

VERMILION ENERGY

SEEKING RELEVANT PERSONS

Vermilion is seeking to consult with relevant persons whose functions, interests or activities may be affected by proposed activities in the Wandoo Field.

Vermilion Oil and Gas Australia is a subsidiary of Vermilion Energy and has operated in Australia for over 20 years. Our Australian operations focus on exploring for and developing oil and gas from the Wandoo Field off the shore of Western Australia.

The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island. It operates at a water depth in the range from 50m - 60m.

Our Activities

Vermilion wishes to continue developing and producing from its existing exploration permit WA-14-L. The Wandoo Field currently operates under existing accepted Environmental Plans for both production and well construction.

However, Vermilion is preparing two Environment Plans for submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

Relevant Person Information

Learn more about who is a relevant person to be consulted, the environment that may be affected by the proposed activities, and the proposed control measures on our website.

Project Location

Your Feedback

If you think you may be a relevant person, please contact us to discuss consultation or provide feedback at the below channels.

We are asking relevant persons to provide feedback by 17 January 2025.

For More Information

Email: abu.consultation@vermilionenergy.com

To visit our website, scan the QR code

www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

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TRANSFER OF LAND ACT 1893

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TRUSTEES ACT 1962 DECEASED ESTATES Notice to Creditors and Claimants

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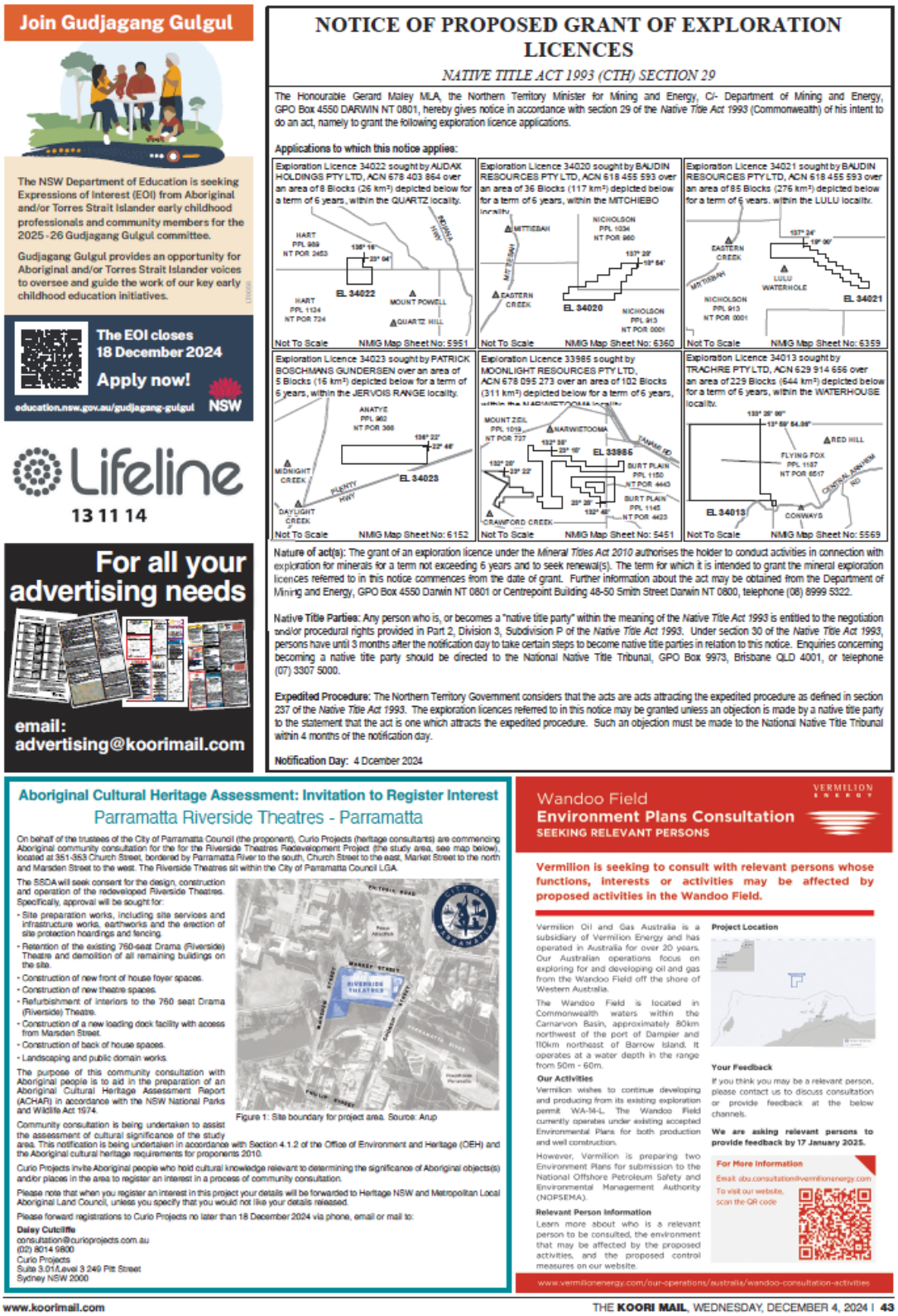
Figure 1-5: Koori Mail – 4 December 2024



Join Gudjagang Gulgul

The NSW Department of Education is seeking Expressions of Interest (EOI) from Aboriginal and/or Torres Strait Islander early childhood professionals and community members for the 2025-26 Gudjagang Gulgul committee.

Gudjagang Gulgul provides an opportunity for Aboriginal and/or Torres Strait Islander voices to oversee and guide the work of our key early childhood education initiatives.

The EOI closes 18 December 2024

Apply now!

education.nsw.gov.au/gudjagang-gulgul NSW

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NOTICE OF PROPOSED GRANT OF EXPLORATION LICENCES

NATIVE TITLE ACT 1993 (CTH) SECTION 29

The Honourable Gerard Maley MLA, the Northern Territory Minister for Mining and Energy, C/- Department of Mining and Energy, GPO Box 4550 DARWIN NT 0801, hereby gives notice in accordance with section 29 of the *Native Title Act 1993* (Commonwealth) of his intent to do an act, namely to grant the following exploration licence applications.

Applications to which this notice applies:

Exploration Licence 34022 sought by AUDAX HOLDINGS PTY LTD, ACN 678 403 864 over an area of 8 Blocks (26 km²) depicted below for a term of 6 years, within the QUARTZ locality.

Not To Scale NMIG Map Sheet No: 5951

Exploration Licence 34020 sought by BAUDIN RESOURCES PTY LTD, ACN 618 455 593 over an area of 36 Blocks (117 km²) depicted below for a term of 6 years, within the MITCHIEBO locality.

Not To Scale NMIG Map Sheet No: 6360

Exploration Licence 34021 sought by BAUDIN RESOURCES PTY LTD, ACN 618 455 593 over an area of 85 Blocks (276 km²) depicted below for a term of 6 years, within the LULU locality.

Not To Scale NMIG Map Sheet No: 6359

Exploration Licence 34023 sought by PATRICK BOSCHMANS GUNDERSEN over an area of 5 Blocks (16 km²) depicted below for a term of 6 years, within the JERVOIS RANGE locality.

Not To Scale NMIG Map Sheet No: 6152

Exploration Licence 33985 sought by MOONLIGHT RESOURCES PTY LTD, ACN 678 095 273 over an area of 102 Blocks (311 km²) depicted below for a term of 6 years, within the NARWIETOOMA locality.

Not To Scale NMIG Map Sheet No: 5451

Exploration Licence 34013 sought by TRACHRE PTY LTD, ACN 629 914 656 over an area of 229 Blocks (644 km²) depicted below for a term of 6 years, within the WATERHOUSE locality.

Not To Scale NMIG Map Sheet No: 5569

Nature of act(s): The grant of an exploration licence under the *Mineral Titles Act 2010* authorises the holder to conduct activities in connection with exploration for minerals for a term not exceeding 6 years and to seek renewal(s). The term for which it is intended to grant the mineral exploration licences referred to in this notice commences from the date of grant. Further information about the act may be obtained from the Department of Mining and Energy, GPO Box 4550 Darwin NT 0801 or Centrepoint Building 48-50 Smith Street Darwin NT 0800, telephone (08) 8999 5322.

Native Title Parties: Any person who is, or becomes a "native title party" within the meaning of the *Native Title Act 1993* is entitled to the negotiation and/or procedural rights provided in Part 2, Division 3, Subdivision P of the *Native Title Act 1993*. Under section 30 of the *Native Title Act 1993*, persons have until 3 months after the notification day to take certain steps to become native title parties in relation to this notice. Enquiries concerning becoming a native title party should be directed to the National Native Title Tribunal, GPO Box 9973, Brisbane QLD 4001, or telephone (07) 3307 5000.

Expedited Procedure: The Northern Territory Government considers that the acts are acts attracting the expedited procedure as defined in section 237 of the *Native Title Act 1993*. The exploration licences referred to in this notice may be granted unless an objection is made by a native title party to the statement that the act is one which attracts the expedited procedure. Such an objection must be made to the National Native Title Tribunal within 4 months of the notification day.

Notification Day: 4 December 2024

Aboriginal Cultural Heritage Assessment: Invitation to Register Interest

Parramatta Riverside Theatres - Parramatta

On behalf of the trustees of the City of Parramatta Council (the proponent), Curio Projects (heritage consultants) are commencing Aboriginal community consultation for the for the Riverside Theatres Redevelopment Project (the study area, see map below), located at 351-353 Church Street, bordered by Parramatta River to the south, Church Street to the east, Market Street to the north and Marsden Street to the west. The Riverside Theatres sit within the City of Parramatta Council LGA.

The SSDA will seek consent for the design, construction and operation of the redeveloped Riverside Theatres. Specifically, approval will be sought for:

- Site preparation works, including site services and infrastructure works, earthworks and the erection of site protection hoardings and fencing.
- Retention of the existing 760-seat Drama (Riverside) Theatre and demolition of all remaining buildings on the site.
- Construction of new front of house foyer spaces.
- Construction of new theatre spaces.
- Refurbishment of interiors to the 760 seat Drama (Riverside) Theatre.
- Construction of a new loading dock facility with access from Marsden Street.
- Construction of back of house spaces.
- Landscaping and public domain works.

The purpose of this community consultation with Aboriginal people is to aid in the preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR) in accordance with the NSW National Parks and Wildlife Act 1974.

Figure 1: Site boundary for project area. Source: Arup

Community consultation is being undertaken to assist the assessment of cultural significance of the study area. This notification is being undertaken in accordance with Section 4.1.2 of the Office of Environment and Heritage (OEH) and the Aboriginal cultural heritage requirements for proponents 2010.

Curio Projects invite Aboriginal people who hold cultural knowledge relevant to determining the significance of Aboriginal objects(s) and/or places in the area to register an interest in a process of community consultation.

Please note that when you register an interest in this project your details will be forwarded to Heritage NSW and Metropolitan Local Aboriginal Land Council, unless you specify that you would not like your details released.

Please forward registrations to Curio Projects no later than 18 December 2024 via phone, email or mail to:

Daisy Cutcliffe
consultation@curioprojects.com.au
(02) 8014 9800
Curio Projects
Suite 3.01/Level 3 249 Pitt Street
Sydney NSW 2000

Wandoo Field Environment Plans Consultation

SEEKING RELEVANT PERSONS

VERMILION ENERGY

Vermilion is seeking to consult with relevant persons whose functions, interests or activities may be affected by proposed activities in the Wandoo Field.

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Email: obu.consultation@vermilionenergy.com

To visit our website, scan the QR code

www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

Figure 1-6: Mid-West Times – 4 December 2024

10 NEWS midwesttimes.com.au Mid-West Times Wednesday, December 4, 2024

Car chase leads to jail term

MATTHEW PADDICK

A 33-year-old man has been jailed for a year over a two-hour police chase that started in Geraldton and ended half-way to Perth.

Zak Rodney Cleminson appeared in Geraldton Magistrates Court via video link from Greenough Prison on Friday for sentencing, after pleading guilty to five charges last month, including driving a vehicle that failed to comply with a direction to stop, reckless driving in a confiscation zone to escape police pursuit, using an unlicensed vehicle on a road, obscene acts in public and possessing a prohibited drug.

Police said on Wednesday, November 6 about 1.30pm, Cleminson drove a Holden Commodore sedan without displaying number plates, when police in an unmarked car tried to flag him down. He drove through several back roads in Geraldton, up to 60km/h above the speed limit and weaving in and out of traffic.

Cleminson then dropped a passenger off in Wandina, before setting off towards Dongara, reaching 140km/h at times. Police used a tyre deflation device to deflate his front-right tyre. Cleminson made it as far as Badgingarra, about 225km south of Geraldton.

Police say he attempted to inject drugs into his arm when officers approached him.

Cleminson was also sentenced for exposing himself in front of a teenage girl in Midland in April.

In regard to the chase, Cleminson said he was being threatened by the passenger not to pull over, but conceded he was "off my head" on methamphetamine.

Magistrate Kelly Thompson said drugs had an underlying role in Cleminson's mental health condition.

Cleminson was sentenced to 12 months, made eligible for parole, given a $600 fine, and had his licence disqualified for two years.

Heritage buildings boost

MATTHEW PADDICK

A church and a military museum in the Mid West have received funding from the State Government to help future-proof the heritage sites for years to come.

St John the Baptist Anglican Church in Dongara received $50,000 as part of the WA Government's Heritage Grants Program, which aims to protect and conserve heritage sites across the State.

The money will go towards damp remediation, drainage works and structural works.

Agricultural Region MLC Sandra Carr said the contribution was significant for the church.

"St John the Baptist Anglican Church, Dongara, is a significant and valued piece of the Shire of Irwin's history," she said.

"This funding will help preserve important local history so it can be enjoyed by the community now and into the future."

Geraldton's Birdwood House.

Geraldton's Birdwood House was given a grant of $34,844 to help with repairs.

These include masonry repairs, damp remediation and a conservation management plan.

The museum features military artefacts, including weapons, medals and letters.

The building also hosts the Geraldton RSL and Anzac Day and Remembrance Day services each year.


St John the Baptist church in Dongara. Picture: Churches Australia

Figure 1-7: North-West Telegraph – 4 December 2024

6 NEWS northwesttelegraph.com.au NORTH WEST Telegraph Wednesday, December 4, 2024

Premier offers $150m in bid to bolster lithium

JESSICA PAGE & ADRIAN RAUSO

Premier Roger Cook has announced a $150 million rescue package for WA lithium miners to ride out the price collapse — but companies will have to prove they can pay back assistance.

"We're not bailing mining companies out, we're providing them with short-term (assistance) to get through a period of being challenged because of the global markets," Mr Cook said.

The struggling industry was given the heads-up that relief would be forthcoming last month after Mineral Resources announced it would mothball its Bald Hill operations in the Goldfields, not long after Rio Tinto's Mt Cattlin operation — also located in the Goldfields — was shuttered.

Lithium miners in a project ramp-up phase will be given relief for electricity and water costs, port fees and mining tenement fees, which will be waived for up to 24 months to the value of $9.4 million. This will benefit Liontown Resources, which recently scaled back expansion plans at its Kathleen Valley mine north-east of Perth.

Struggling miners will also be offered access to a $50 million interest-free loan facility to sustain production. But only for two years or until the spodumene price recovers to $US1100 a tonne.

S&P Global data shows the price of lithium-rich spodumene concentrate — a key ingredient in lithium-ion batteries and other devices — has fallen from $US8000 a tonne to less than $US900 a tonne within the past two years.

Downstream lithium processors, which comprises IGO, Albemarle and China's Tianqi, will have government fees temporarily waived for up to two years, equating to a total value of $90 million. "Our lithium industry is crucial to my Government's plan to diversify the economy, to decarbonise the economy," Mr Cook said.

"Our lithium miners are internationally competitive. They're efficient and they're agile . . . despite the industry's strength, it is struggling at the moment as a result of global market conditions."

Mr Cook said companies will have to pass due diligence to access any Government loans, in the wake of the recent tax evasion scandal to hit Mineral Resources boss Chris Ellison.

"Obviously we need to be convinced that these companies are operating in a manner which gives us the confidence to enter into a financial assistance agreement with them," he said.

"We will make sure we do our due diligence in relation to any financial assistance payment for any company."

Figure 1-8: The West Australian – 10 December 2024

Public Notices

GENERAL

PROPOSAL TO UPGRADE A MOBILE PHONE BASE STATION MONOPOLE AT 173 CANNING ROAD KARRAGULLEN WA 6111 (near intersection of Littelys and Canning Road)

Telstra is proposing to upgrade the existing mobile phone infrastructure at the above address to allow for the introduction of 5G to Telstra's network (and reconfiguration of existing technologies if required).

- The proposal consists of the addition of NR850 (5G technologies). Also included technologies LTE700 (4G)
- Six (6) panel antenna
- Six (6) tower mounted amplifiers (TMA)
- The removal of redundant equipment including six (6) antenna
- Ancillary works may be necessary for the safety and functioning of the existing mobile phone base station and may include antenna mounts, signage, conduits, cables, maintenance and safety equipment.

Telstra regards the proposed installation as a Low-impact Facility under the Telecommunications (Low impact Facilities) Determination 2018 ("The Determination") based on the description above.

In accordance with Section 7 of the C564:2020 Mobile Phone Base Station Deployment Code we invite you to provide feedback about the proposal. Requests should be directed to Petra Patrocinor, on behalf of Telstra, at **telco@petrapatrocinor.com.** Contact No: 0421 699 789.

Further information can be obtained at www.rfnsa.com.au by entering **RFNSA no. 6111003. The closing date for all submissions is the COB 5pm 13 January 2025.**

Cyient Australia Pty Ltd ABN 70 601669327 Telstra Limited ACN 086 174 781

GENERAL

ROAD TRAFFIC ACT 1974

SECTIONS 80G (3)(E) AND 80G (4)(B)

NOTICE OF INTENTION TO MAKE APPLICATION TO A COURT FOR AN ORDER TO IMPOUND/ CONFISCATE A VEHICLE

Pursuant to the Road Traffic Act 1974, the Western Australia Police hereby advise the below mentioned vehicles are subject to pending applications to have them impounded or confiscated.

W.A. Registration: 1ESB712
Vehicle: Mitsubishi Lancer
Magistrates Court: Fitzroy Crossing

W.A. Registration: 1DWG562
Vehicle: Hyundai I45
Magistrates Court: Armadale

W.A. Registration: 1GAT198
Vehicle: Ford Fiesta
Magistrates Court: Perth

W.A. Registration: 1HKQ082
Vehicle: MG SAS23
Magistrates Court: Perth

Any person with an interest in any of these vehicles who wishes to make a submission to the Court regarding the application to impound or confiscate the vehicles is advised to contact the relevant Magistrates Court Registry.

Col BLANCH
Commissioner of Police

Personal

GENERAL

GENERAL

VERMILION ENERGY

Wandoo Field
Environment Plans Consultation
SEEKING RELEVANT PERSONS

Vermilion is seeking to consult with relevant persons whose functions, interests or activities may be affected by proposed activities in the Wandoo Field.

Vermilion Oil and Gas Australia is a subsidiary of Vermilion Energy and has operated in Australia for over 20 years. Our Australian operations focus on exploring for and developing oil and gas from the Wandoo Field off the shore of Western Australia.

The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island. It operates at a water depth in the range from 50m - 60m.

Our Activities

Vermilion wishes to continue developing and producing from its existing exploration permit WA-14-L. The Wandoo Field currently operates under existing accepted Environmental Plans for both production and well construction.

However, Vermilion is preparing two Environment Plans for submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

Relevant Person Information

Learn more about who is a relevant person to be consulted, the environment that may be affected by the proposed activities, and the proposed control measures on our website.

Project Location

Your Feedback

If you think you may be a relevant person, please contact us to discuss consultation or provide feedback at the below channels.

We are asking relevant persons to provide feedback by 17 January 2025.

For More Information

Email: abu.consultation@vermilionenergy.com

To visit our website, scan the QR code

www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

44 SPORT

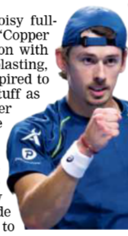
The West Australian
Tuesday, December 10, 2024

DEMON ENDS YEAR ON HIGH

LONDON

Alex de Minaur wrapped his landmark year with one last illuminating and lucrative triumph in an all-singing, all-dancing rock 'n' roll version of the sport at the Ultimate Tennis Showdown grand final in London.

Played in front of a noisy full-house at the old Olympic "Copper Box" venue in east London with lights flashing and music blasting, "The Demon" seemed inspired to deliver some of his best stuff as he beat Danish star Holger Rune in the final of the eight-man tournament on Sunday. Played over four eight-minute quarters with only one serve per point and barely any time between points, de Minaur, right, appeared to thrive in this manically abbreviated, unashamedly youth-oriented version of the game as he won all five of his matches over three days.



Swearing that the format, packed with pressure points, was perfect to help him in his preparations for the Australian Open in the new year, he may also have had his head turned by earning a small fortune for his week's work — total prizemoney of $1.2 million.

Over the three days, de Minaur beat Rune, Jan-Lennard Struff, Alexander Bublik, Gael Monfils and then Rune again in the final on his way to the crown.

"It definitely has been the best season yet, but I don't think it's going to be the best season of my career," he said post-match. "I want to keep on improving. I want to keep on getting better."

Kyrgios return an enigma: Rafter

Tennis great Pat Rafter says he won't be surprised if Nick Kyrgios makes the Australian Open semifinals.

Nor will Rafter be shocked if the former Wimbledon finalist flops and crashes out in the first round in his much-anticipated major return at Melbourne Park month.

Australia's former Davis Cup captain believes it's impossible to predict how his ex-charge will fare on his competitive return after more than two years out with serious wrist and knee injuries.

"You'd never write anyone off with the talent that Nick has. It's pretty amazing," Rafter said. "I really don't know what he's done, though. A year and a half off the game . . . so it's going to be interesting. I have no expectations or no understanding about how he is going to go."

Summary

Basketball

NBA: Philadelphia 108, Chicago 100; Milwaukee 118, Brooklyn 113; Charlotte 113, Indiana 109; Denver 141, Atlanta 111; Orlando 115, Phoenix 110; Memphis 140, Washington 112; San Antonio 121, New Orleans 116; Golden State 114, Minnesota 106; Sacramento 141, Utah 97; Houston 117, L.A. Clippers 106; Miami 122, Cleveland 113; LA Lakers 107, Portland 98.

Boating

Maylands: Club Championship Heat 3: Mirrors: 1. 2Pudd (Doug & Sage). 2. Mama Mia (Matilda & Richard). 3. Storm (Nathan & Orson). Sabres: 1. Kalibo (R Stoeger). 2. Way 2 Go (S Underwood). 3. Gold (S Rose). Lasers: 1. Turbo III (T Gaunt Jnr). 2. Water Taxi (R Hermans). 3. Stuffabout (J Toonen).

Bowls

Albany: Men's Sets Pairs: 1st: C Bahr , D Kempin 2nd: J Vanderven, B Retallack Plate: R Plant, K Battison 2nd: M Heberle, M McGuire

Central Stirling Bowling League: Ladies Pennants Rd 6 at Jerramungup. Gnowangerup (4) M Wellstead 28 def Ongerup (0) R Hams 9 . Jerramungup (4) R Lee 22 def Tambellup (0) P Rosendaal 15 .

Middleton Beach: Wednesday Social 1st K Richardson-Newton, J Brown, C Moir 2+16 2nd J Jarvis, K Pascoe J Radys 2+15 3rd R Stanley, G Davison, K Rendell 2+7 Middleton Beach Friday Twilight 1st T North, B Jefferis, J Hill,J Radys 1+10 2nd L Holt, G Davison P Ramsden 1+7 Men"s Pennants 1st Div Mid Beach Gold 62 Def Denmark 59 5-1 1st Div Mid Beach Greed 58 Def Emu Point Purple 50 5-1 1st Div Mid Brach Black 57 Def Albany Gold 57 3.5-2.5 2nd Div Mid Beach White 58 Def Albany Green 57 5-1 3rd Div Mid Beach Lime 66 lost to Greenrange 76 1-5

Mosman Park: Men's Triples Championship: Winners S. Swanson, D. Adams, J.Adams

Safety Bay: Men's Monday Pairs. 1. B Mouton, J Sime. 2. R Dickens, M Syme. WoL. 1. G Heathcote, B Shackles. 2. S Smith, B Maybury. Ladies Tuesday Bankers. L Cleary. 2. C Bell & A Minotti. Wednesday Pairs. 1. I Arndt, L Gandy. 2. R Clark, D Smith. WoL. S Smith, P Smith. Thursday Mixed Bankers. 1. J Mulligan, P Harcus, D Haworth, R Dunn. 2. L Hind, M Minotti, H Roberts, M Gillott. Saturday Mixed Bankers. 1. L Hashman, T Martin, J Spalding, J Buchanan. N Cox, W Bramsen, T Spinks, T Angel.

Thornlie: Mens Pairs championship Winners A Payne and G Vaughan, R/Up M Forrester and D Slade, Plate Winners G Winter and R Carruthers R/Up F Radi and W Wendt Ladies Pairs ChampionshipJ Winners J Forrester a G Daines R/Up T Fenwick and J Fielder Plate Winners M Yates and M Carruthers R/Up N Separovich and P Triner

Golf

Augusta: Scroungers S/F P Cunningham 20 points J Eddy 20 C Robertson 20 I Offer 19 J Italiano 19 Zoran 19 J McGuire 19 L/P 2 J Swarbrick Golf Ball B Reay. Friday B Bowden 18 points M Munday 18 G Foster 17 B Brown17 H Gerritsen 17 N/P 11 Zoran L/P 18 J Ross Golf Ball K Bain Tuesday S/F C Jones 34 net M Russell 35 J McGuire 36 G Ball 37 J Italiano 38 G Foster 38 N/P 2 A Brown L/P S Nixon Golf Ball C Robertson Friday J Ross 20 points M Russell 18 J Butcher 18 J Altman 18 J Italiano 16 N/P J Butcher L/P M Russell Golf Ball M Munday. Saturday 2 Person Ambrose L Shephard &D Kenworthy 66.75 G Ball & R Jones 67 S Williams& B Brown 67.5 G Foster &R Nielson 68 A&K Brown 68.25 S Douglas & C Robertson 68.25. Sunday mixed S/F A Brown 36 points J Fenwick 35 J Eddy 34 Golf Ball L Shephard.

Dongara: Saturday L Mitchell 37pts, V Gatfield 34pts, P Blair 34pts, NTP #11 P Blair. Sunday D Blade 38pts, D Broad 34pts, R Bradley 33pts - Men S Hodgman 34pts, D Giltrow 33pts, P Bradley 33pts, I Rose 33 Pts. NTP #3 Best 2nd R Parsons, #5 R Drummond, H Duane, #11 R Parsons, S Hodgman, #14 P Bradley, R Parsons.

Mandurah: Par: C Evans +9, D Winkless +5, W Bullard +3, D Griffiths +2, P Price +2, E Pankhurst +1, S Pope +1, G McCarney +1, K Brandis +1, S Roney +1, D Taylor +1, S Muir +1, L Lasek 0, R Lock 0, A Bryant 0, W Chatfield 0, G Lawton 0, M Fyfe 0, G Wood 0, D Litchfield 0, N Renouf 0, J Benbow -1, D Smith -1, R Francis -1, T Rasmussen -1, G Sieniszkiewicz -1, D Macdonald -1

Melville Glades: Tuesday Ladies Par: C Orr +5, V Khuu +5, J Dagg +3, C Beaumont +2, R Bianchini +2, J Davies +1, R Cotton (Gosnells Golf Club) +1, L McVey +1, M Corbett 0, A Jackson 0, P McHugh 0, A Hoy 0. 9 Holes: J O'Meara +2, D West +1, D Banfield +1, J Spencer +1, C Robinson +1, E Dutton +1, M Kim 0, S Hitchcock 0, N Toth 0, C Cave 0, S Van Der Brugghen 0. Wednesday Mens AM Stableford: G Crerie 39, M Thomas 39, K Lumsden 37, R Graham 37, M Gillespie 37, S Hird 37, M Bowles 36, M Anderson 36, S Corney 36 Wednesday Mens PM Stableford: J Gilmour 41, J Lopes 40, D Ball 40, N Kennedy 39, S Goodsell 38, B More 37, P Pereira 37, V Ristovichis 37, M Warburton 37, G Ammon 36, M Downes 36, D Hitchcock 36, D Warburton 36 Thursday Ladies Stableford: R Cotton 38, J Davies 36, J Park 36, P Graham 35, L Sinclair 34, A Jackson 34, S Kingston 34. 9 Holes: A Searles 20, G Wawn 18, J Watters 18, N Katnic 17, J Maddox 17, S Van Der Brugghen 17, M O'Brien 16, C Robinson 16 Saturday Mens AM Stableford: H Harris 42, C Finnie 40, C Son 40, K Lumsden 39, K Adey 38, J Adams 38, K Bakker 38, Q Hess 38, R Brownbill 37, S Reid 37, K Harper 37, J Ranford 37, E Ee 37, B Thomas 37, J Matthewson 37, L Wallace 37 Saturday Mens PM Stableford: D Davies 41, P Tan 41, F Davies 41, M Jackson 40, B Woodward 40, A Clark 40, B Catterall 40, S Gill 39, S Morgan 39, R Lasrado 39, S Runkle 38, L Nuttall 38, D Dyer 38, C Spalding 38, M Rossi 37, K Foley 37, R Lusardi 37, G Watson 37, B More 37, P McHugh 37, D Warburton 37, D Owen 37. Saturday Ladies Stableford: C Orr 38, A Lee 36, R Burd 36.

Wembley: Westside GC: Stableford: D Cox 41; Guy Evans 39; E Teune 39; T Waddle 37; A Gilmour 36; T Kennedy 36

Westaviat: Stableford - G Wenn 39, W Cooper 36, T Baker 36, L West 35, S Baker 34, P Marshall 34, R Weppner 34, P Cooper 33, S Fyduniw 32, M Hutch 32, D Adams 32, W Eberhard32, P Bowditch 30.

Gridiron

NFL: Seahawks 26 Jets 21; VIKINGS 23, CARDINALS 22; STEELERS 44, BENGALS 38; CHARGERS 17, FALCONS 13; COLTS 25, PATRIOTS 24; TEXANS 23, JAGUARS 20; COMMANDERS 42, TITANS 19; RAMS 21, SAINTS 14; EAGLES 24, RAVENS 19; BUCCANEERS 26, PANTHERS 23, OT; BILLS 35, 49ERS 10

Tennis

MundoTenis Open, Brazil: Women's Singles Semifinals: Maja Chwalinska (7), Poland, def. Leolia Jeanjean (8), France, 6-0, 6-3. Ylena In-Albon, Switzerland, def. Maria Carle (1), Argentina, 3-6, 7-6 (9), 6-2. **Women's Singles Championship:** Maja Chwalinska (7), Poland, def. Ylena In-Albon, Switzerland, 6-1, 6-2.

Open Angers Arena Loire, France: Women's Singles Championship: Alycia Parks (3), United States, def. Belinda Bencic, Switzerland, 7-6 (4), 3-6, 6-0. **Women's Doubles Championship:** Monica Niculescu and Elena-Gabriela Ruse (1), Romania, def. Belinda Bencic and Celine Naef, Switzerland, 6-3, 6-4.

Giannis Antetokounmpo of the Milwaukee Bucks dives for the ball in his team's 118-113 win over the Brooklyn Nets.

Figure 1-9: Mid-West Times – 11 December 2024

20 LIFESTYLE midwesttimes.com.au Times Wednesday, December 11, 2024

The answer is in the detail

GARDENING
CHARLIE ALBONE

Sometimes you walk into an outdoor space to find it has all the things you love about a garden: a swimming pool, garden beds and lawn areas. Then there are gardens that have the same features but for some intangible reason it's next level, with extra feeling and atmosphere.

The difference between a nice garden and an outstanding one is that feeling of atmosphere, and this can be achieved without employing a landscape designer.

Start out by setting some boundaries. The parameters of a space set the tone for all that is held in between. When trying to create atmosphere everything inside these boundaries must be in the same theme to create impact. Larger gardens can be split up into "garden rooms". Be confident with your theme in a smaller space.

Hedges and green boundaries make for great backdrops. Clipped hedges suit formal gardens and loose mixtures of planting can be used for tropical relaxed affairs. Hard structures such as stone walls or pergolas will be more arresting on the eye and help focus you around a space.

The boundaries of your garden should also consider the space above your head. Do you want the sky open to the elements, or are you trying to create the feeling of a dining-room experience, where you have a built structure overhead?

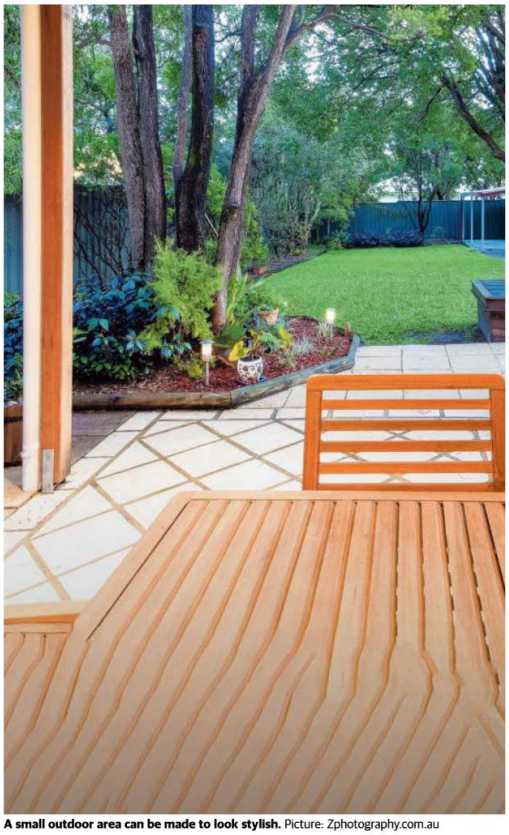
Deciduous trees make for an amazing roof and a natural way to bring atmosphere to a space. You can train trees to be like a living pergola over a dining table, adding interest and difference to your garden.

A garden should be about all the senses, not just the visual. Adding fragrant flowers, edible plants, noisy water features and tactile surfaces — all draw you to a certain viewpoint in the garden. By having all of your senses put on alert you'll be more immersed in the garden space and the atmosphere will be heightened.

At night, use lighting to create drama and add an extra layer of atmosphere to the space. This can make the garden feel like a completely new space. When lighting a garden there will always be an element of practicality, such as steps and any trip points. Once this is taken care of, rather than thinking about lighting features, think about creating shadows off them. This will not only make the space look better, but it will make it more comfortable to be in. For entertaining spaces, fairy lights and festoon lighting will supply just enough light to make the space usable but not be too overwhelming.

Candlelight on tables adds a sense of romance and gives your garden a point of difference over other outdoor spaces. Placing a cluster of candles on a table is a lovely way to draw you outside.

If I had to have one trick for creating atmosphere for any size garden it would be an obsession with detail. Consider the scale and proportion of each feature element, how hard materials meet, how fixings are covered , the plant selection and how they grow together. Everything you think of should be cohesive with each and every element in the space. It's this level of detail that will take your garden from average to show-stopping.



A small outdoor area can be made to look stylish. Picture: Zphotography.com.au

Head-turning Xmas cake

RECIPE

Impress your guests with this showstopping but easy Christmas cake.

Ingredients

3½ cups self-raising flour
1½ cups brown sugar
1 tbsp mixed spice
1 tbsp ground ginger
375g unsalted butter, chopped
6 eggs, beaten
finely grated rind and juice of 2 oranges
200g sour cream
410g jar fruit mince
For the brandy butter cream
375g unsalted butter, softened
1 tbsp vanilla bean paste
4½ cups icing sugar, sifted
½ cup brandy

Method

Preheat oven to 150C. Grease and line the base and sides of three 20cm cake pans. Place flour, sugar, spice, ginger, butter and a pinch of salt in a bowl. Using fingers, rub in butter until mixture resembles breadcrumbs.

In a separate bowl, add eggs, rind, juice, sour cream and fruit mince; mix. Add flour mixture and beat well to combine.

Divide mixture evenly among cake pans. Bake for 45 minutes. Cool cakes in pans.

To make brandy butter cream, beat butter and vanilla in a bowl with an electric mixer until as white as possible. Gradually beat in icing sugar, then brandy until fluffy. To assemble, place one cake on a serving plate and spread with 1 cup of the buttercream. Top with another cake and another cup of buttercream.

Top with remaining cake and generously top the cake with remaining buttercream, spreading to the sides for a smudged effect.

Serves 12

Figure 1-10: Broome Advertiser – 12 December 2024

Minister says meth rise not connected to liquor

NATASHA CLARK

WA Police Minister Paul Papalia rejects links between tough new liquor restrictions across Broome and Derby and a sharp rise in meth use in the towns, labelling them "ridiculous claims".

"Methamphetamine is an issue, but it's nowhere near the sort of issue you get in the city," Mr Papalia said.

"A small amount here can make a big difference."

He made the comments on Saturday in Broome while announcing more detectives from the drug and firearm squad would be working in the Kimberley as part of Operation Regional Shield over the holiday season.

Mr Papalia also announced almost $10 million in funding for the Kimberley Juvenile Justice Strategy for the next two years, which will go towards night space pilot programs in Broome and Fitzroy Crossing.

According to WA Police statistics, alcohol-related offences decreased 21 per cent, and family and domestic violence dropped by 8 per cent, across the Broome-Derby region from August 16 to October 6 this year, compared with the same period in 2023. Mr Papalia said in Derby, 220km north of Broome, "there has been between a 20 to 30 per cent reduction in family and domestic violence offences, and a massive reduction in call-outs for police".

However, Derby shire president and joint chair of the Fitzroy Crossing flood committee Peter McCumstie refuted the minister's dismissal of the notion that meth use was increasing in the Kimberley region.

"We aren't imagining this," Mr McCumstie said.

"This was highlighted clearly at a meeting I attended of over 90 people a fortnight ago in Fitzroy Crossing.

"Members of the community, including police officers and health workers, raised concerns about the increase in the use of meth and other drugs in the community.

"Leaders also reported at the meeting they are seeing more meth-related crime in the region."

To establish a more accurate understanding of the Kimberley meth problem, Mr McCumstie called for drug testing of wastewater across the region.

"That will prove or disprove what is happening, it's as simple as that," he said.

Mr Papalia said the trafficking of methamphetamine and other illicit drugs in the Kimberley was achieved the same way as in the rest of the State.

"It (illicit drugs) mostly comes from overseas," he said.

He cited a "53 per cent reduction in meth consumption" across WA during the COVID-18 lockdown period as evidence supporting his claim about the international nature of the drug trafficking operation.

"Once it reaches Western Australia it is distributed mostly by outlaw motorcycle gangs," he said.

To demonstrate the targeting of drug trafficking in the region, Cdr Rod Wilde announced at Saturday's press conference that police had charged two people with supplying meth overnight.

He didn't disclose the exact amount of methamphetamine but said the drugs had been seized.

Cdr Wilde issued a clear warning to drug dealers in the Kimberley.

"So meth dealers, if you've got meth in your house, watch out," he said.

"Police will come and knock your door down to arrest you."

Kimberley MLA Divinia D'Anna, Commander Rod Wilde, newly appointed Kimberley Supt John Hutchinson, and Minister for Police Paul Papalia in Broome Pictures: Natasha Clark

Police Minister Paul Papalia and Kimberley MLA Divina D'Anna announce Operation Regional Shield.

Figure 1-11: Koori Mail – 18 December 2024

NOTICE TO GRANT MINING TENEMENTS

***NATIVE TITLE ACT 1993 (CTH)* SECTION 29**

The State of Western Australia HEREBY GIVES NOTICE that the Minister for Mines and Petroleum, C/- Department of Energy, Mines, Industry Regulation and Safety, 100 Plain Street, East Perth WA 6004 may grant the following tenement applications under the *Mining Act 1978*:

Tenement Type	No.	Applicant	Area*	Locality	Centroid	Shire
Exploration Licence	09/3743	TECHGEN METALS LTD	209L	80.9km S'ly of Panzburdoo	Lat. 23° 55' S; Long. 117° 44' E	UPPER GASCOYNE SHIRE
Exploration Licence	09/3744	JUNO GOLD PTY LTD	568L	78.9km E'ly of Mt Augustus	Lat. 24° 2' S; Long. 117° 37' E	UPPER GASCOYNE SHIRE
Exploration Licence	38/3966	GTT METALS GROUP PTY LTD	188L	191.9km E'ly of Wiluna	Lat. 26° 41' S; Long. 122° 8' E	WILUNA SHIRE
Exploration Licence	38/3968	GTT METALS GROUP PTY LTD	178L	199km NE'ly of Leinster	Lat. 26° 47' S; Long. 122° 15' E	LAWERTON SHIRE, WILUNA SHIRE
Exploration Licence	38/3969	GTT METALS GROUP PTY LTD	5BL	186km NE'ly of Leinster	Lat. 26° 54' S; Long. 122° 11' E	LAWERTON SHIRE
Exploration Licence	38/3970	GTT METALS GROUP PTY LTD	2BL	187.9km NE'ly of Leinster	Lat. 26° 56' S; Long. 122° 14' E	LAWERTON SHIRE
Exploration Licence	38/3973	BARACUS PTY LTD	48L	187.6km NE'ly of Leinster	Lat. 26° 50' S; Long. 122° 9' E	LAWERTON SHIRE, WILUNA SHIRE
Exploration Licence	51/2127	GREAT WESTERN EXPLORATION LIMITED	629L	87.7km NW'ly of Wiluna	Lat. 26° 11' S; Long. 119° 28' E	MEEKATHARRA SHIRE
Exploration Licence	51/2128	GREAT WESTERN EXPLORATION LIMITED	618L	86km NW'ly of Wiluna	Lat. 26° 4' S; Long. 119° 34' E	MEEKATHARRA SHIRE
Exploration Licence	51/2251	YERRIDA CO PTY LTD	9BL	84.3km N'ly of Wiluna	Lat. 25° 51' S; Long. 120° 2' E	MEEKATHARRA SHIRE
Exploration Licence	51/2252	YERRIDA CO PTY LTD	198L	84.3km N'ly of Wiluna	Lat. 25° 52' S; Long. 119° 58' E	MEEKATHARRA SHIRE
Exploration Licence	51/2253	YERRIDA CO PTY LTD	298L	83.3km SE'ly of Peak Hill	Lat. 25° 59' S; Long. 119° 27' E	MEEKATHARRA SHIRE
Exploration Licence	51/2254	YERRIDA CO PTY LTD	538L	59km SE'ly of Peak Hill	Lat. 25° 56' S; Long. 119° 12' E	MEEKATHARRA SHIRE
Exploration Licence	52/4404	AMERY HOLDINGS PTY LTD	329L	81.9km S'ly of Panzburdoo	Lat. 23° 55' S; Long. 117° 50' E	MEEKATHARRA SHIRE, UPPER GASCOYNE SHIRE
Exploration Licence	57/1375	AURUMIN SANDSTONE PTY LTD	158L	28km SE'ly of Sandstone	Lat. 28° 11' S; Long. 119° 27' E	SANDSTONE SHIRE
Exploration Licence	57/1458	RIO TINTO EXPLORATION PTY LIMITED	208L	72.9km SE'ly of Sandstone	Lat. 28° 27' S; Long. 119° 49' E	MENZIES SHIRE, SANDSTONE SHIRE
Exploration Licence	70/6661	MID-WEST EXPLORATION PTY LTD	9BL	126.9km E'ly of Kalbarri	Lat. 27° 22' S; Long. 115° 25' E	MURCHISON SHIRE
Exploration Licence	70/6662	MID-WEST EXPLORATION PTY LTD	2BL	119.9km N'ly of Mullewa	Lat. 27° 27' S; Long. 115° 25' E	MURCHISON SHIRE
Exploration Licence	77/3253	BLACK DRAGON ENERGY (AUS) PTY LTD	6BL	33km S'ly of Marvel Loch	Lat. 31° 44' S; Long. 119° 36' E	YILGARN SHIRE
Exploration Licence	77/3254	BLACK DRAGON ENERGY (AUS) PTY LTD	1BL	31.8km S'ly of Marvel Loch	Lat. 31° 44' S; Long. 119° 35' E	YILGARN SHIRE
Prospecting Licence	15/6020	FMG RESOURCES PTY LTD	40.23HA	14.5km SW'ly of Coolgardie	Lat. 31° 2' S; Long. 121° 5' E	COOLGARDIE SHIRE
Prospecting Licence	25/2843	FORTIFY MINING PTY LTD	199.12HA	43.8km E'ly of Kalgoorlie	Lat. 30° 50' S; Long. 121° 54' E	KALGOORLIE-BOULDER CITY
Prospecting Licence	25/2844	MAHONEY, Reece Anthony	196.72HA	28.7km E'ly of Kalgoorlie	Lat. 30° 44' S; Long. 121° 46' E	KALGOORLIE-BOULDER CITY
Prospecting Licence	25/2852	FLEMING, Leo Glenn	198.52HA	30.2km E'ly of Kalgoorlie	Lat. 30° 41' S; Long. 121° 46' E	KALGOORLIE-BOULDER CITY
Prospecting Licence	27/2592	RESOURCE ASSETS PTY LTD	188.08HA	26.3km NE'ly of Kalgoorlie	Lat. 30° 32' S; Long. 121° 38' E	KALGOORLIE-BOULDER CITY
Prospecting Licence	27/2593	RESOURCE ASSETS PTY LTD	149.55HA	29.9km NE'ly of Kalgoorlie	Lat. 30° 31' S; Long. 121° 38' E	KALGOORLIE-BOULDER CITY
Prospecting Licence	27/2594	RESOURCE ASSETS PTY LTD	152.89HA	31.3km E'ly of Broad Arrow	Lat. 30° 30' S; Long. 121° 38' E	KALGOORLIE-BOULDER CITY
Prospecting Licence	27/2595	RESOURCE ASSETS PTY LTD	163.23HA	30.5km E'ly of Broad Arrow	Lat. 30° 30' S; Long. 121° 38' E	KALGOORLIE-BOULDER CITY
Prospecting Licence	27/2596	RESOURCE ASSETS PTY LTD	171.23HA	29.7km E'ly of Broad Arrow	Lat. 30° 30' S; Long. 121° 37' E	KALGOORLIE-BOULDER CITY
Prospecting Licence	36/1960	MANDALAY METALS PTY LTD	51.78HA	24.5km S'ly of Leinster	Lat. 28° 8' S; Long. 120° 58' E	LEONORA SHIRE

Nature of the act: Grant of prospecting licences which authorises the applicant to prospect for minerals for a term of 4 years from date of grant. Grant of exploration licences, which authorises the applicant to explore for minerals for a term of 5 years from the date of grant.
Notification day: 18 December 2024
Native title parties: Under section 30 of the *Native Title Act 1993 (Cth)*, persons have until 3 months after the notification day to take certain steps to become native title parties in relation to applications. The 3 month period closes on **18 March 2025.** Any person who is, or becomes a native title party, is entitled to the negotiation and/or procedural rights provided in Part 2 Division 3 Subdivision P of *Native Title Act 1993 (Cth)*. Enquiries in relation to filing a native title determination application to become a native title party should be directed to the Federal Court of Australia, 1 Victoria Avenue, Perth WA 6000, telephone (08) 9268 7100.
Expedited procedure: The State of Western Australia considers that these acts are acts attracting the expedited procedure. Each licence may be granted unless, within the period of 4 months after the notification day (i.e. **18 April 2025**), a native title party lodges an objection with the National Native Title Tribunal against the inclusion of the statement that the State considers the grant of the licence is an act attracting the expedited procedure. Enquiries in relation to lodging an objection should be directed to the National Native Title Tribunal, Level 5, 1 Victoria Avenue, Perth, or GPO Box 9973, Perth, WA 6848, telephone (08) 9425 1000.
For further information about the act (including extracts of plans showing the boundaries of the applications), contact the Department of Energy, Mines, Industry Regulation and Safety, 100 Plain Street, East Perth WA 6004, or telephone (08) 9222 3518.
*- 1 Graticular Block = 2.8 km²

DMIRS 34434

Heritage Council of NSW

Heritage Act 1977

Notice of intention to consider listing on the State Heritage Register

The Heritage Council of NSW maintains the State Heritage Register which is a list of places of particular importance to the people of NSW, including Aboriginal and other heritage.

The Heritage Council of NSW is considering whether to recommend the amendment of the State Heritage Register listing for Rose Seidler House (00261) to become the Seidler Family Precinct in acknowledgment of its heritage significance.

Seidler Family Precinct, Wahroonga

Written submissions on this listing amendment are invited from any interested person by 11:59pm 11 March 2025. Enquiries to Meggan Walker on (02) 9873 8500.

The Heritage Council is interested in receiving information in writing, by email, telephone or in person from the Aboriginal community or Aboriginal organisations on the potential Aboriginal significance of this place.

See more details about the nominated place at
environment.nsw.gov.au/topics/heritage/request-a-heritage-listing/nominate-an-item-for-listing-on-the-state-heritage-register/comment-on-nominations

Make your submission at:
haveyoursay.nsw.gov.au/seidler

or direct your submission to:
Heritage Council of NSW
Locked Bag 5020
Parramatta NSW 2124

Heritage Council of NSW

Heritage Act 1977

Notice of intention to consider listing on the State Heritage Register

The Heritage Council of NSW maintains the State Heritage Register which is a list of places of particular importance to the people of NSW, including Aboriginal and other heritage.

The Heritage Council is currently considering whether or not to recommend the amendment of a listing of the following place on the State Heritage Register in acknowledgment of its heritage significance.

Lady Gowrie Child Centre, Erskineville

Written submissions on this listing are invited from any interested person by 9 February 2025. Enquiries to Darrienne Wyndham or Judith Coombes on (02) 9873 8500.

The Heritage Council is interested in receiving information in writing, by email, telephone or in person from the Aboriginal community or Aboriginal organisations on the potential Aboriginal significance of this place.

See more details about the nominated place at
environment.nsw.gov.au/topics/heritage/request-a-heritage-listing/nominate-an-item-for-listing-on-the-state-heritage-register/comment-on-nominations

Make your submission at:
haveyoursay.nsw.gov.au/erskineville

or direct your submission to:
Heritage Council of NSW
Locked Bag 5020
Parramatta NSW 2124

Wandoo Field
Environment Plans Consultation
SEEKING RELEVANT PERSONS

VERMILION ENERGY

Vermilion is seeking to consult with relevant persons whose functions, interests or activities may be affected by proposed activities in the Wandoo Field.

Vermilion Oil and Gas Australia is a subsidiary of Vermilion Energy and has operated in Australia for over 20 years. Our Australian operations focus on exploring for and developing oil and gas from the Wandoo Field off the shore of Western Australia.

The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island. It operates at a water depth in the range from 50m - 60m.

Our Activities
Vermilion wishes to continue developing and producing from its existing exploration permit WA-14-L. The Wandoo Field currently operates under existing accepted Environmental Plans for both production and well construction.

However, Vermilion is preparing two Environment Plans for submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

Relevant Person Information
Learn more about who is a relevant person to be consulted, the environment that may be affected by the proposed activities, and the proposed control measures on our website.

Project Location

Your Feedback
If you think you may be a relevant person, please contact us to discuss consultation or provide feedback at the below channels.

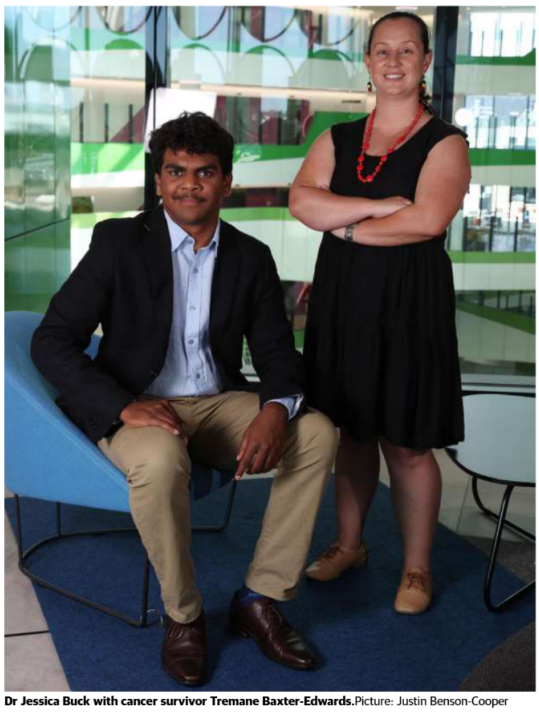
We are asking relevant persons to provide feedback by 17 January 2025.

For More Information
Email: obv.consultation@vermilionenergy.com
To visit our website, scan the QR code

www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

Figure 1-12: North-West Telegraph – 18 December 2024

8 NEWS
northwesttelegraph.com.au
NORTH WEST Telegraph
Wednesday, December 18, 2024



Dr Jessica Buck with cancer survivor Tremane Baxter-Edwards. Picture: Justin Benson-Cooper

On a mission to boost kids' chances in cancer fight

HANNAH CROSS

A world-first program led by Perth researchers will investigate why First Nations children with cancer have poorer survival rates than other Australian children, in a bid to transform the way they are treated.

The Kids Research Institute Australia program, launched on Wednesday, aims to identify the main barriers to improved outcomes and why the side effects of cancer treatment are so severe in Aboriginal children.

Led by Kamilaroi woman and paediatric brain cancer researcher Dr Jessica Buck, it is the first research project of its kind to be Aboriginal-led, culturally informed and community focused.

"We really don't know much about First Nations kids with cancer because there's been hardly any studies done," Dr Buck said.

"There's less than 10 research studies that have ever been done ... so the level of knowledge at the moment is very low.

"What we do know so far is that they have worse survival rates, but we don't know why."

This is particularly the case in the Northern Territory, where the five-year survival rate is 38 per cent for First Nations children and 79 per cent for other children.

Australia-wide, the survival rate for First Nations children is as low as 70.6 per cent compared to 83.5 per cent for other Australian children.

"We think it's probably a combination of clinical access, biology and social determinants of health," Dr Buck said.

"What I'm hoping to do is unravel that and work out how we can find better treatments for First Nations kids with cancer."

Dr Buck said the project would first and foremost be guided by what the community wanted out of such a project.

"We're talking to Aboriginal families who've had a child diagnosed with cancer, we're talking with local elders, we're talking with Aboriginal doctors who work in the childhood cancer space, and we're asking them what they need from a new research program," she said.

"What things do they wish that research had the answers to? How could their journey through childhood cancer have been improved when their family was going through it?"

Elizabeth Wilkes and Jessica Buck.

The project will be led by a community advisory group made up of local elders and community members with lived experience of childhood cancer, supported by Noongar woman and Aboriginal community engagement co-ordinator Elizabeth Wilkes.

One of the early recruits has been Menang Goreng elder Averil Williams, whose daughter battled and survived leukaemia.

Ms Williams said access to information to better inform community was crucial to reduce any fear or uncertainty around treatment.

"It's like when my little girl was diagnosed with leukaemia. I said, I want to know what's going to happen. I want to know what's the treatment," she said.

"For our mob to have access to that information, and by this getting out into the community, it will become more receptive than a fearful thing."

Childhood cancer survivor Tremane Baxter-Edwards said the new research project would bring "greater advocacy and greater attention" to Aboriginal kids' cancer experience.

He was diagnosed at age three with Burkitt lymphoma, a rare, fast-growing and aggressive type of blood cancer, so doesn't remember much about his treatment.

"I do recall leaving home for a long period of time ... that was one of the difficult processes, along with chemo," Mr Baxter-Edwards, now 18, said.

He and his three siblings lived more than 3000km away in Wyndham, in the Kimberley region, meaning his single mother had to travel down to Perth with a sick toddler while his grandparents helped raise his siblings.

Dr Buck's research offers a way forward for First Nations children and their families as they navigate cancer treatment, he said. "It is a frightening period of someone's life, doesn't matter if you're Aboriginal or not, it's a very frightening thing for your family and yourself," Mr Baxter-Edwards said.

"Dr Buck, being an Aboriginal woman herself, makes it a lot more inviting in the sense that we're able to have a lead researcher on something that is so near and dear to a lot of people's hearts, including myself."

Dr Buck and her team will also investigate pharmacogenomics, which looks at the way someone's genes affect how they respond to medicines. "Pharmacogenomics has never really been studied in Aboriginal people — adults or children — for cancer or other conditions," she said.

"And so we wonder whether Aboriginal patients might be metabolising or processing the medicines different in their body."

Genetics may also be able to identify why Aboriginal children are more prone to acute myeloid leukaemia, with very little known to date about why this may be.

It's a big undertaking, but Dr Buck is well and truly up for the challenge. It's personal for her, too.

"My nan passed away from breast cancer when I was little, and that's always been one of my motivators to go into science and medical research," she said.

"I've had a lot of scientific training and I've always wanted to use that to be able to give back to community and help improve outcomes for cancer in Aboriginal communities."

Figure 1-13: Pilbara Times – 18 December 2024

Pilbara NEWS
Wednesday, December 18, 2024
pilbaranews.com.au

Centre has the right recipe

Molly Singline and Bryan Charlie.

Mark Smith and Glenn Higgins.

The. accent is on healthy meals.

Tahlia Lenton, Courtney Talbot and Katarina Jaques in the kitchen. Pictures: Madelin Hayes

MADELIN HAYES

The Yaandina Youth Centre kitchen was humming with busy cooks chopping, crumbing and baking earlier this week for Volunteering WA's final corporate volunteer day of the year.

In 2024, corporate volunteers from a range of companies spent more than 270 hours preparing about 1800 meals for young people visiting the centre through Volunteering WA's program.

This has given youth centre staff greater capacity to play, listen and engage with children who come into the centre, instead of cooking meals.

"The program has been invaluable to us," Yaandina Community Services youth and family services manager Ruth Hansen said.

"Prior to Volunteering WA coming here, we had our youth workers in the kitchen cooking a lot, so it would take up a lot of our time and resources."

The Yaandina Youth Centre runs an after-school program Monday-Friday and a school holiday program every day.

"As we're open so much, it means a lot of food is needed for the kids," Ms Hansen said.

"We might feed them three times during the day, usually breakfast, a late lunch, and then maybe something before they go.

"There are also children who are playing sport, so by the time they get here they're hungry, or for those that don't go to school, they have been by themselves a lot during the day and are hungry.

Kelly Nunn and Ruth Hansen at the Yaandina Youth Centre.

"We like to pump the meals full of veggies and with plenty of nutritional value, because a lot of the time the kids will just reach for junk food when they're not here."

Volunteering WA regional community engagement co-ordinator Kelly Nunn said the program was equally rewarding for volunteers.

"In a corporate setting, you don't often get the opportunity to get out of the office or workplace and have fun with your colleagues while doing something different and contributing to a good cause outside of work," she said.

"A lot of the teams that do corporate volunteering with us in the Pilbara are FIFO crew, so they don't get to see what is in our community.

"We conduct feedback at the end of every session and volunteers often see a benefit to their team…".

According to Volunteering WA, employees of businesses who participate in its corporate volunteering program report the benefits being a sense of wellbeing and happiness (84 per cent), awareness of wider social issues (81 per cent), pride in their company and job (79 per cent), and understanding and empathy (81 per cent).

Figure 1-14: Broome Advertiser – 9 January 2025

Broome Advertiser
Thursday, January 9, 2025
broomead.com.au

Book showcases kids' art

CAIN ANDREWS

A Kimberley-born charity has marked the success of Saltwater Stories, a high-end coffee-table book featuring art created by children from its Saltwater Academy program.

The book, launched in October, emerged from the charity Saltwater Country's Saltwater Stories initiative — part of the academy's Crossroads Knowledge Highway, which offers creative industry training in film, photography, sculpture and podcasting to youth across the Kimberley.

Saltwater Country director Cara Peek said the participant-centred program offered young people an opportunity to test their creative skills in a culturally safe environment, facilitated by Aboriginal mentors.

"It's about helping young people discover their interests, understand what they're good at, and pursue their passions," she said.

"Unlike other programs, this one produces tangible results — artwork, exhibitions, and a book they can share with family and friends. It gives them a sense of ownership and achievement."

Ms Peek described the book as "a culmination of over a decade of work".

"Because of COVID, the process took a lot longer for this first round than we would anticipate occurring in the future, but it also provided us with a lot of lessons," she said.

"It's empowering and I'm really proud that, despite COVID and the logistics of working with remote communities, we were able to pull it off."

The inaugural A3 black-and-white edition of the book features artwork by children in the program, guided by prominent local artists such as Aboriginal graphic novelist Brenton McKenna, who led workshops in Broome, Derby, Fitzroy Crossing, Warmun, and Frog Hollow.

The Indigiverse Comics founder, artist and writer hailing from Broome said inspiring kids in the remote Kimberley to pursue art was something he had always wanted to do.

"I do comic book workshops in schools around the country, but this was the first time I had the opportunity to go into my own backyard in the East Kimberley and do some workshops out there, which is what I've wanted to do, so I was really chuffed," McKenna said.

Aboriginal comic artist Brenton McKenna at the Saltwater Stories exhibition.

Cara Peek

"Whether it's cartooning or authoring or illustrating, it doesn't matter.

"I just want to ignite a love for telling a story.

"I'm really glad that Saltwater Country let me go and work my magic out there."

As one of just a handful of Aboriginal comic book artists and cartoonists, McKenna said the workshops were also a good way to scout for the next generation of Aboriginal comic talents.

"I'm always looking for the next Aboriginal graphic novelist or cartoonist, and I think it means a little bit more to me if I can find them in the Kimberley," he said.

"It's tying in really well that I get to do workshops and look for that future graphic novelist out there somewhere.

"There's a lot of up-and-coming young people, but we still need more."

The artistic contributions extend beyond the book, including films and sculptures of bulls and horses crafted from reclaimed materials, which debuted at Saltwater Country's rodeo, campdraft and country music event, Rhythm and Ride, in 2022.

The book was successfully launched through online events featuring notable figures, including bull rider Isaac Leclair and Asylum Seekers Resource Centre chief executive Kon Karapanagiotidis.

Saltwater Country operates without ongoing operational funding, relying on donations, sponsorships and sales of the Saltwater Stories book to sustain its programs.

Ms Peek said every dollar invested generated a social return of $2.64, underscoring the program's value to the community.

"We're always seeking donations and volunteers," she said.

"This book is an easy way for people to support Indigenous communities and be part of the solution."

The book is available for purchase online at the Saltwater Country website and at the charity's headquarters on Dampier Terrace.

Ms Peek said Saltwater Country hoped to turn the Saltwater Stories book into an annual tradition, showcasing the progression of creativity in the program.

"With consistent funding, we could deliver these programs year-round and make an even greater impact," she said.

Figure 1-15: Pilbara Times – 15 January 2025

Pilbara NEWS
Wednesday, January 15, 2025
pilbaranews.com.au

PM pitches $200m to turbocharge regional WA

JESSICA PAGE

Anthony Albanese has vowed to turbocharge regional WA with a $200 million cash splash to boost housing and community infrastructure, as he landed in the State that swept him to power in 2022.

Mr Albanese flew into Kununurra last Wednesday night — his 27th visit to WA as Prime Minister — ahead of announcing the major package to build almost 1400 new homes across the State.

It supports Premier Roger Cook's push for more people to move to regional WA.

"Regional WA is a beautiful place to live, work and visit," Mr Albanese said.

"My Government wants to ensure it has the housing and amenities it needs to continue to grow and thrive."

On Thursday the Federal Government announced $90m for the delivery of water, power and road infrastructure to service 1367 new homes across Karratha, the Wheatbelt and Lockyer in the Great Southern.

Another $100m is being spent on local infrastructure in the State's north, including $1.9m for a Kununurra riverbank recreation project, $15m for a Newman youth centre and childcare, and $13m for new pontoons and landscaping to boost fishing tourism in Wyndham.

"Our WA Labor Government is working with the Albanese Federal Government to build more houses and deliver important investments right across regional WA," Mr Cook said.

He revealed his ambition for Broome, Karratha and Port Hedland to become "big urban centres" in December, warning Perth's population boom was not sustainable.

Modelling predicting Karratha's population could increase by 35 per cent by 2030 has alarmed residents.

The median rent in the region has almost tripled from $400 per week in 2016 to $1100 last year, according to the Real Estate Institute of WA.

That is almost double Perth's median rent of $650 per week.

Port services in Wyndham, Ashburton and Dampier will also be expanded to secure local supply chains and fast-track imports if Labor wins the Federal poll, due before May 17.

Mr Albanese said changes to allow more direct international shipping would make a "huge difference" across the East Kimberley and Pilbara.

The so-called "first port of entry" changes across the trio of ports in WA's north have been hailed a "game changer" by the State Government amid predictions export volumes out of Wyndham could increase five-fold to 1.3 million tonnes.

Federal Infrastructure Minister Catherine King said it would save businesses millions in transport costs and time.

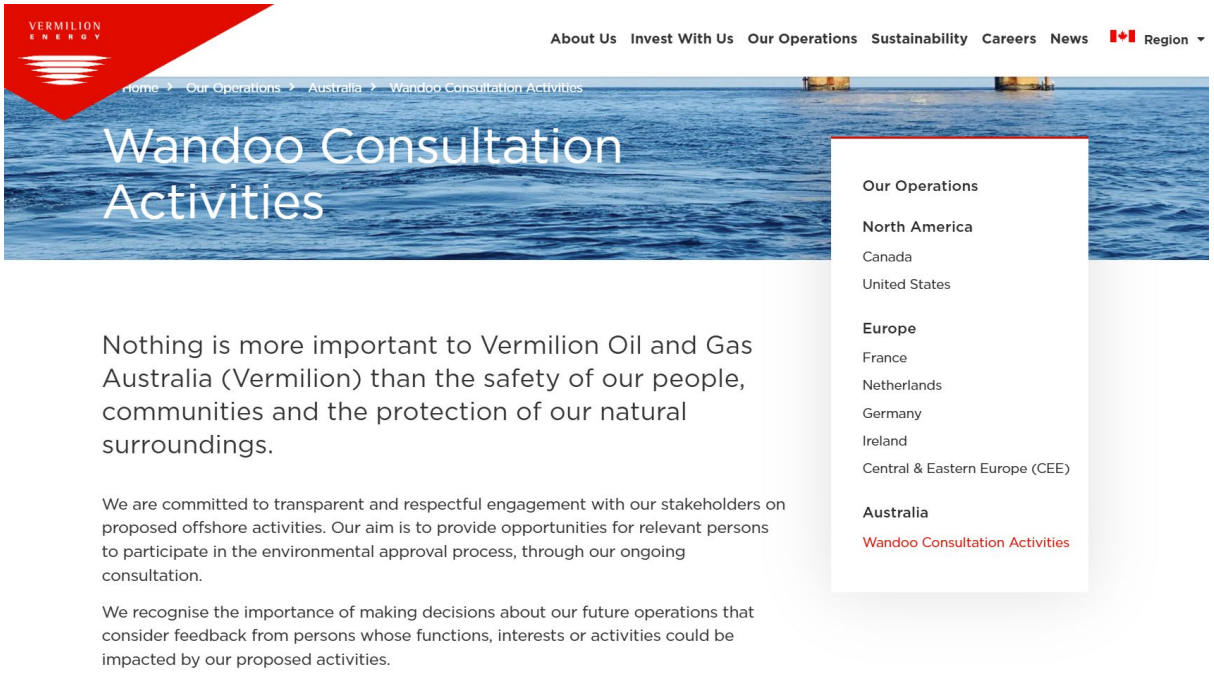
"With the number of vessels to pass through the port of Wyndham each year expected to double by 2033, this decision backs in critical WA businesses and supports communities in the north-east of the State," she said.

Meanwhile, the Port of Ashburton would establish ongoing international shipping services for the first time.

The Pilbara Port Authority has estimated 13 million tonnes of iron ore and rare earths could be shipped out of there by 2030.

Prime Minister Anthony Albanese arrives in Kununurra. Picture: Andrew Ritchie

Figure 1-16: Consultation website



Wandoo Environment Plans

Vermilion has operated the Wandoo field since 2005, located approximately 80 km northwest of Karratha, Western Australia, in Commonwealth waters.

We are preparing to undertake additional offshore activities, including a shallow hazard geophysical and geotechnical survey in 2025 and exploration drilling in 2025/2026. Our operational and development drilling Environment Plans will be updated for submission early 2026. Environment Plans for these activities will be submitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for acceptance.

Consultation with stakeholders is vital for confirming that our proposed activities will mitigate environmental impacts and risks to acceptable levels. We welcome input from individuals and organisations whose interests may be affected by our initiatives.

▸ **Upcoming Activities**

▸ **Current Activities**

Environment Plans and Consultation

In preparing our Environment Plans, we consult with relevant stakeholders to gather insights on the local environment, including specific concerns about the potential impacts of offshore petroleum activities at Wandoo.

This feedback is essential for assessing measures to avoid or reduce impacts on communities, heritage values, and ecological and cultural features of the environment. During consultation, your input will inform the control measures we propose in the Environment Plans to mitigate these impacts and risks.

Are you a Relevant Person?

You may be considered a relevant person if you or your organisation have functions, interests, or activities that could be impacted by our proposed activities in the Wandoo field.

As part of our consultation process, Vermilion is proactively reaching out to relevant stakeholders. If you are a community member, Traditional Owner, or business owner who may be affected by our offshore activities and have not yet been contacted, we encourage you to get in touch with us.

Contact abu.consultation@vermilionenergy.com or (08) 9217-5858 to register your details and receive information about our Environment Plans.

Your Feedback

To provide feedback on our proposed activities, **please contact us** at abu.consultation@vermilionenergy.com or (08) 9217-5858.

We will review all stakeholder responses during our ongoing consultation process and consider their implications for our proposed activities, making revisions to Environment Plans as needed.

Please note that your feedback, along with our response, will be included in the Environment Plans submitted to the NOPSEMA. If your feedback is sensitive, please inform us so we can ensure its confidentiality upon submission.

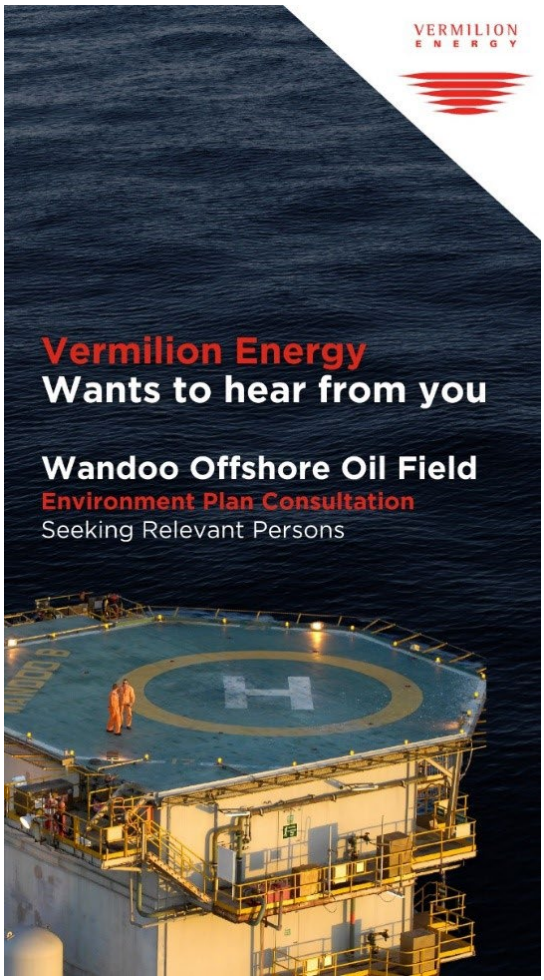
Fundamental objections, threats, social media comments, spam and petitions would not be considered as feedback as they do not meet the intended outcome of consultation.

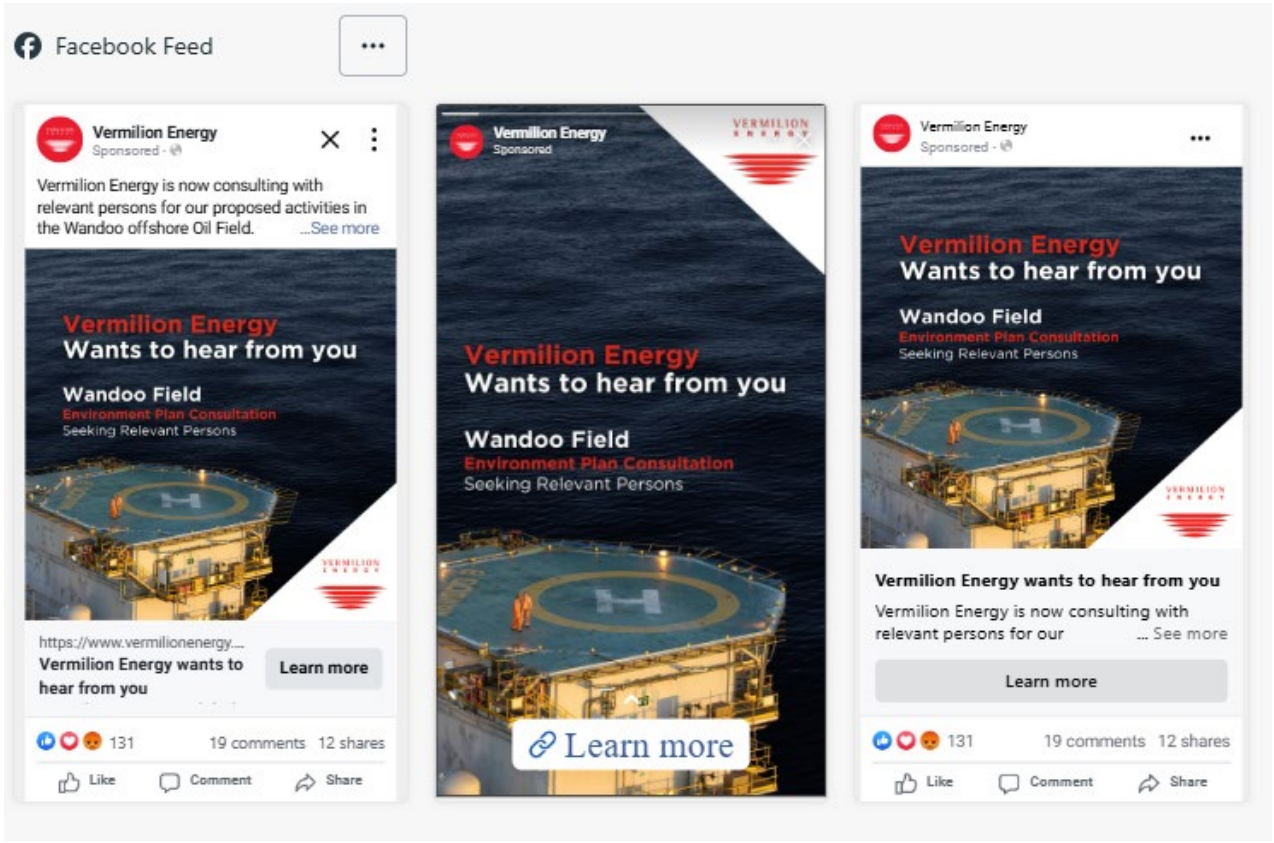
Additional Resources

- Our Wandoo Operations
- Frequently Asked Questions - Wandoo Field Environment Plan Consultation
- NOPSEMA: Environment Plan Content Requirement
- NOPSEMA: Environmental Requirements
- NOPSEMA: Consultation in the Course of Preparing an Environment Plan
- Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations
- NOPSEMA: Environment Plans Assessment Process

Figure 1-17: Social media campaign

Facebook Advertisements





LinkedIn Advertisements

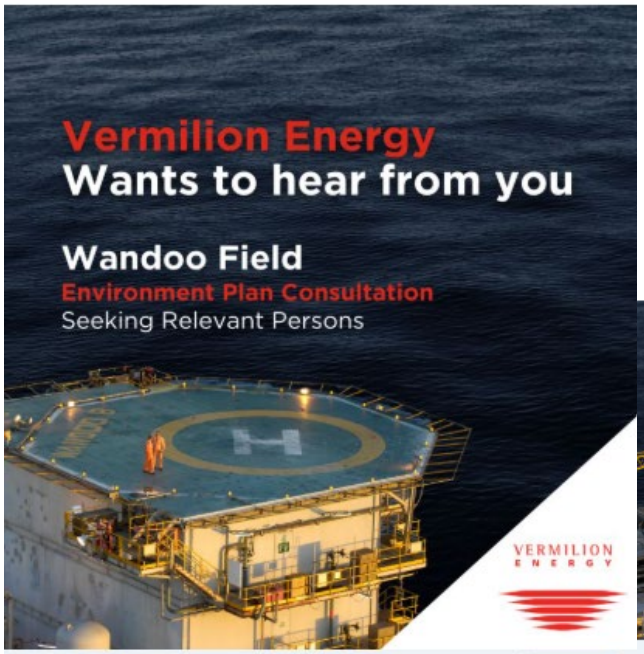
Vermilion Energy
54,686 followers
Promoted

Vermilion Energy is now consulting with relevant persons for our proposed activities in the Wandoo offshore Oil Field.

Wandoo is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island.

Vermilion is seeking to identify and consult with relevant persons whose functions, interests, or activities could be affected by our plans in the Wandoo field.

To learn more, please visit our website. Or,
email: abu.consultation@vermilionenergy.com. Feedback is open until 17 January 2025.



Vermilion Energy wants to hear from you
vermilionenergy.com
Learn more

5

Vermilion Energy
54,686 followers
Promoted

Vermilion Energy is now consulting with relevant persons for our proposed activities in the Wandoo offshore Oil Field.

Wandoo is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island.

Vermilion is seeking to identify and consult with relevant persons whose functions, interests, or activities could be affected by our plans in the Wandoo field.

To learn more, please visit our website. Or,
email: abu.consultation@vermilionenergy.com. Feedback is open until 17 January 2025.

Vermilion Energy wants to hear from you
vermilionenergy.com
Learn more

4

Figure 1-18: Community flyer

VERMILION ENERGY

Wandoo Field
Environment Plans Consultation
SEEKING RELEVANT PERSONS

Vermilion Energy is a long-standing international energy producer operating in North America, Europe, and Australia.

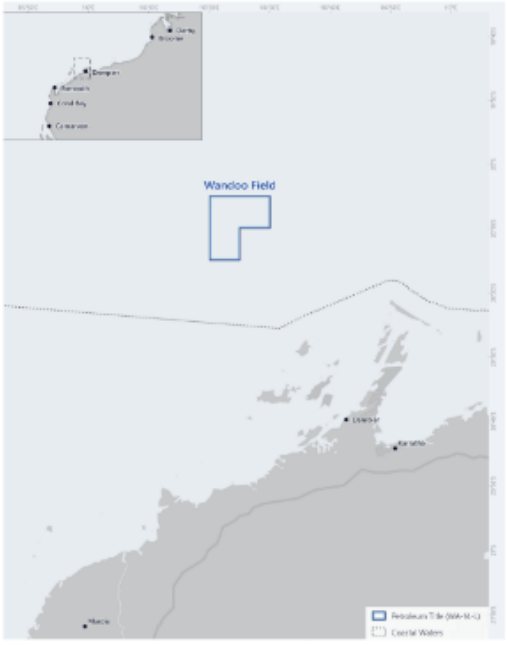
Vermilion Oil and Gas Australia is a subsidiary of Vermilion Energy and has operated in Australia for over 20 years.

Our Australian operations are focused on exploring for and developing oil and gas from the Wandoo Field off the shore of Western Australia.

Wandoo Field

Vermilion currently operates the Wandoo Field within its existing exploration permit WA-14-L.

The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island. It operates at a water depth in the range from 50m - 60m.



Seeking Relevant Persons

Vermilion is seeking to identify and consult with relevant persons whose functions, interests or activities may be affected by our proposed activities at the Wandoo Field.

Vermilion wishes to continue developing and producing from the existing exploration permit WA-14-L. The Wandoo Field operates under existing accepted Environmental Plans in place for production and well construction.

Next year, Vermilion plans to submit two Environment Plans for exploration activities in the second half of 2025 that will help us keep producing from the Wandoo Field.

More information is available on our website (below) regarding who is a relevant person to be consulted, the environment that may be affected by the proposed activities, and the proposed control measures.

If you think you may be a relevant person, please contact us to discuss consultation or provide feedback at the below channels.

For More Information

Email: abu.consultation@vermilionenergy.com

To visit our website, scan the QR code

Figure 1-19: Summary information sheet

VERMILION ENERGY

SUMMARY INFORMATION SHEET
Wandoo Field
Exploration Drilling Environment Plan
December 2024

More information is available in the general Wandoo Field Exploration Drilling Environment Plan Consultation Information Sheet.

Introduction

Vermilion Energy is an international energy producer with 30 years of experience. It operates in North America, Europe and Australia. Vermilion Oil and Gas Australia (the Australian branch) has been operating in Australia for over 20 years. Our Australian operations focus on finding and developing oil and gas at the Wandoo Field off the shore of Western Australia.

The Wandoo Field was discovered in 1991 and oil extraction started in 1993. Vermilion has managed Wandoo since November 2005 and owned it completely since 2007. The Wandoo Field operates under approved Environmental Plans for production at the facility and well construction.

The Wandoo Field is located in Commonwealth waters in the Carnarvon Basin, about 80km northwest of the port of Dampier and 110km northeast of Barrow Island. It operates in water depth of 50m - 60m (**Figure 1**).

Activity details

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one new near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L, under the Wandoo Field Exploration Drilling Environment Plan (EP).

Activity information

- Drilling each well is expected to take approximately 15 to 20 days. This depends on factors such as the availability of a Mobile Offshore Drilling Unit (MODU), severe weather conditions and any technical or equipment issues during the drilling activities.
- The first well is planned for late 2025, pending regulatory approval and rig availability.
- The timing for other activities is not yet decided. The Wandoo Field Exploration Drilling EP assumes the activities could happen at any time of the year over the five years after the EP is accepted.
- Potential impacts, as detailed in the Exploration Drilling Environment Plan Consultation Information Sheet, include noise, the physical presence of a drilling rig and support vessels, routine and non-routine discharges, and atmospheric emissions.

Location

The activities will take place under Vermilion's existing permit area at the Wandoo Field (WA-14-L). The Exploration Drilling Environment Plan Consultation Information Sheet lists the geographical coordinates of the exploration prospects.

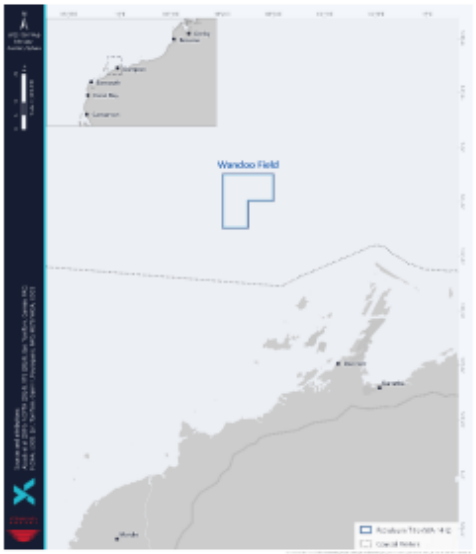


Figure 1. Location of the Wandoo Field

Pictured: Mobile offshore drilling unit (left), Wandoo B (right)

Environmental impacts and management

This work program includes planned activities but may also result in unplanned activities. Both may impact the environment. A table showing all planned and unplanned activities, potential impacts, and management measures for each is included in the general Wandoo Field Exploration Drilling Information Sheet.

The objective is to manage the work program to reduce impacts and risks to as low as reasonably possible.

The total area over which unplanned events could have an environmental impact is shown in **Figure 2.** This is referred to as the environment that may be affected (EMBA).

In the highly unlikely event that an unplanned activity such as a fuel from a vessel collision or oil release from one of the wells occurs, the entire EMBA would not be affected. The part of the EMBA that would be affected would only be known at the time of the event.

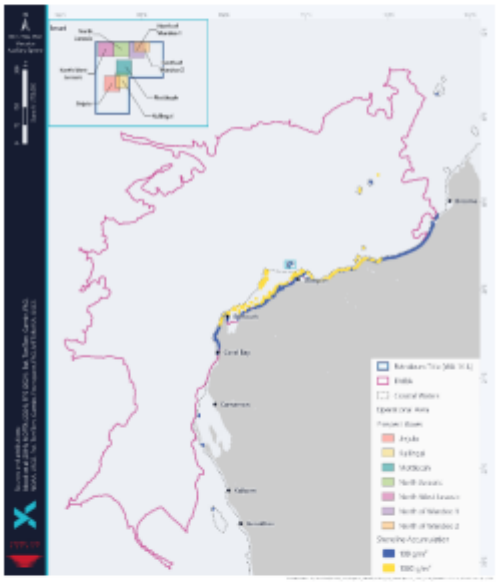


Figure 2. Environment that may be affected

Pictured: Wandoo Field, Wandoo A (left) and Wandoo B (right)

Consultation

Consultation provides Vermilion with an opportunity to receive feedback from those whose functions, interests or activities may be affected by proposed activities. This feedback helps us to refine the management measures to address potential activity impacts and risks.

Consultation also helps us to identify values and sensitivities where information is not publicly available.

Feedback

If you consider you may be a relevant person, please get in touch with us as soon as possible if you require any further information or if you think you are not on our consultation list. We are asking for relevant persons to provide feedback by **17 January 2025**.

Feedback provided by relevant persons will be considered in an addendum to the Wandoo Field Exploration Drilling EP and throughout the life of the activity. Feedback from relevant persons will be included in the EP submitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment.

Please let us know if you would like your personal/organisational details or any part of your feedback to remain private and we will ensure this remains confidential to NOPSEMA.

Contact us

Website: www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

Email: abu.consultation@vermilionenergy.com

Phone: (08) 9217 5858

Figure 1-20: Newspaper Advertisement

Wandoo Field
Environment Plans Consultation
SEEKING RELEVANT PERSONS

VERMILION ENERGY

Vermilion is seeking to consult with relevant persons whose functions, interests or activities may be affected by proposed activities in the Wandoo Field.

Vermilion Oil and Gas Australia is a subsidiary of Vermilion Energy and has operated in Australia for over 20 years. Our Australian operations focus on exploring for and developing oil and gas from the Wandoo Field off the shore of Western Australia.

The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island. It operates at a water depth in the range from 50m - 60m.

Our Activities

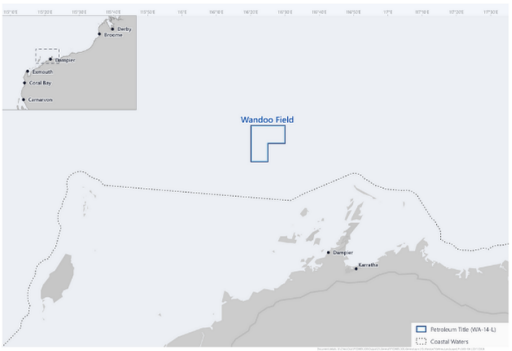
Vermilion wishes to continue developing and producing from its existing exploration permit WA-14-L. The Wandoo Field currently operates under existing accepted Environmental Plans for both production and well construction.

However, Vermilion is preparing two Environment Plans for submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

Relevant Person Information

Learn more about who is a relevant person to be consulted, the environment that may be affected by the proposed activities, and the proposed control measures on our website.

Project Location



Your Feedback

If you think you may be a relevant person, please contact us to discuss consultation or provide feedback at the below channels.

We are asking relevant persons to provide feedback by 17 January 2025.

For More Information

Email: abu.consultation@vermilionenergy.com

To visit our website, scan the QR code

www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

Figure 1-21: Notice of Public Comment – Newspaper Advertisement

Wandoo Field
Exploration Drilling Environment Plan
NOTICE OF PUBLIC COMMENT

VERMILION ENERGY

Vermilion Oil and Gas Australia (VOGA) invites public comment on the Wandoo Field Exploration Drilling Environment Plan.

During the 30 day public comment period interested parties can view and comment on the environmental management of the proposed activity, based on existing measures and controls outlined in the Environment Plan.

The Environment Plan is available on Vermilion's website (at the QR code) and the National Offshore Petroleum Safety Environmental Management Authority (NOPSEMA) website: **info.nopsema.gov.au/home/open_for_comment**

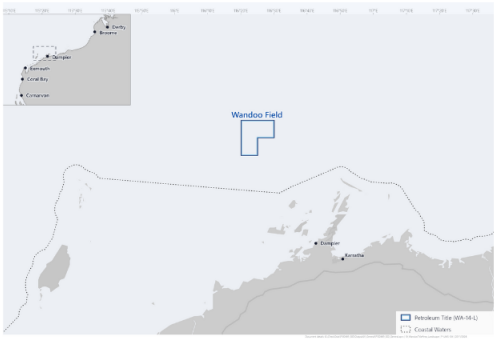
About the proposed activity

VOGA plans to continue producing from its existing permit area WA-14-L in Commonwealth waters within the Carnarvon Basin, about 80km northwest of the port of Dampier and 110km northeast of Barrow Island in Western Australia.

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in 2026-27 and may drill up to six more exploration wells over the next five years.

The activity is scheduled to commence in 2026-27 with the exact timing dependent on the acceptance of the Environment Plan and the availability of a mobile offshore drilling unit.

Project Location



Submitting a comment

Comments can be submitted through NOPSEMA's online Consultation hub: **consultation.nopsema.gov.au**

Relevant comments should relate to the environmental approvals document. Where new information should be considered, supporting documents such as data, scientific reports, or maps are encouraged and can be uploaded via the online platform.

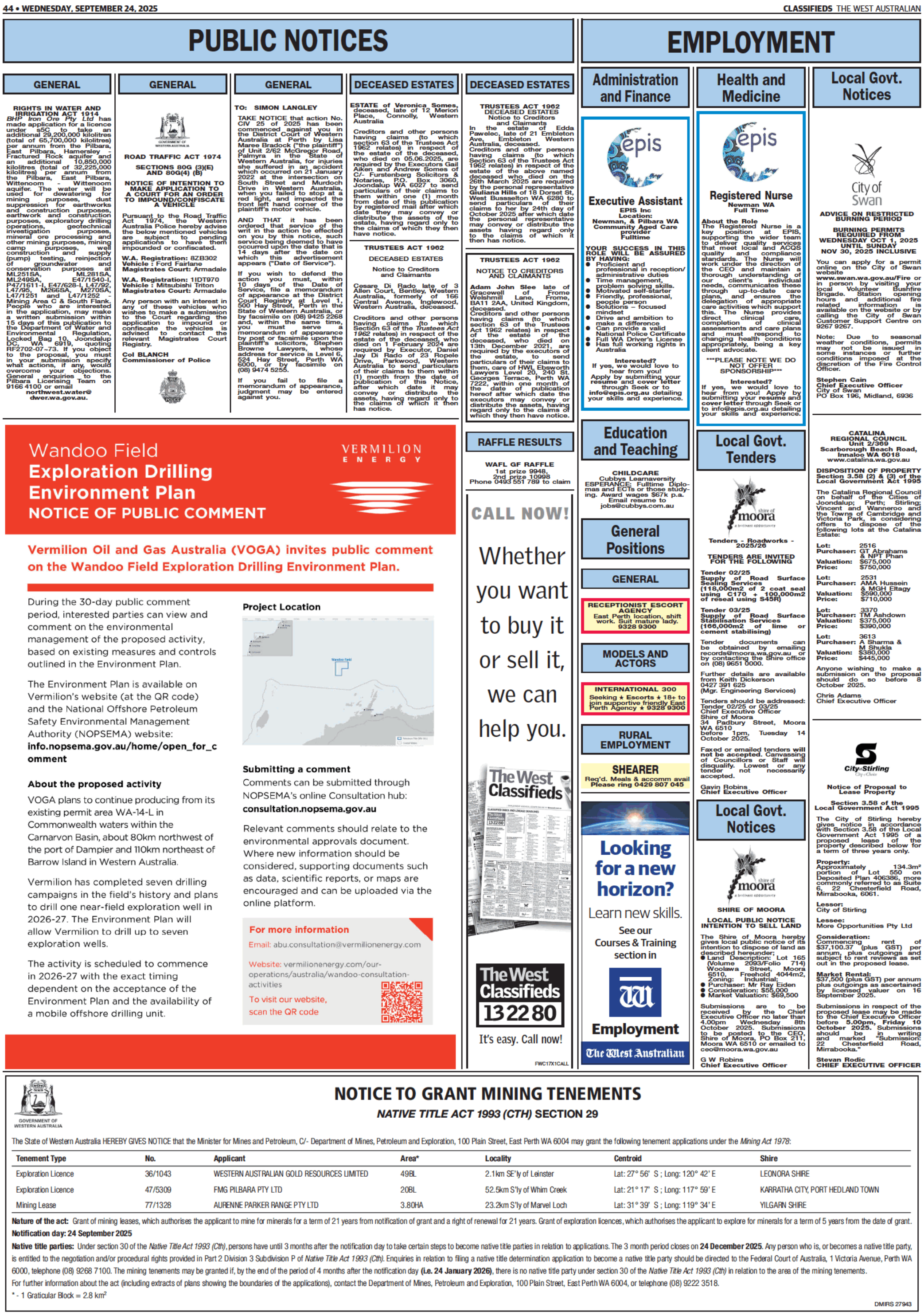
For more information

Email: abu.consultation@vermilionenergy.com

Website: vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

To visit our website, scan the QR code

Figure 1-22: The West Australian, Notice of Public Comment—24 September 2025



44 • WEDNESDAY, SEPTEMBER 24, 2025 — CLASSIFIEDS THE WEST AUSTRALIAN

PUBLIC NOTICES

EMPLOYMENT

Wandoo Field
Exploration Drilling
Environment Plan
NOTICE OF PUBLIC COMMENT

VERMILION ENERGY

Vermilion Oil and Gas Australia (VOGA) invites public comment on the Wandoo Field Exploration Drilling Environment Plan.

During the 30-day public comment period, interested parties can view and comment on the environmental management of the proposed activity, based on existing measures and controls outlined in the Environment Plan.

The Environment Plan is available on Vermilion's website (at the QR code) and the National Offshore Petroleum Safety Environmental Management Authority (NOPSEMA) website: **info.nopsema.gov.au/home/open_for_comment**

About the proposed activity

VOGA plans to continue producing from its existing permit area WA-14-L in Commonwealth waters within the Carnarvon Basin, about 80km northwest of the port of Dampier and 110km northeast of Barrow Island in Western Australia.

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in 2026-27. The Environment Plan will allow Vermilion to drill up to seven exploration wells.

The activity is scheduled to commence in 2026-27 with the exact timing dependent on the acceptance of the Environment Plan and the availability of a mobile offshore drilling unit.

Project Location

Wandoo Field

Submitting a comment

Comments can be submitted through NOPSEMA's online Consultation hub: **consultation.nopsema.gov.au**

Relevant comments should relate to the environmental approvals document. Where new information should be considered, supporting documents such as data, scientific reports, or maps are encouraged and can be uploaded via the online platform.

For more information

Email: abu.consultation@vermilionenergy.com

Website: vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

To visit our website, scan the QR code

NOTICE TO GRANT MINING TENEMENTS

***NATIVE TITLE ACT 1993 (CTH)* SECTION 29**

GOVERNMENT OF WESTERN AUSTRALIA

The State of Western Australia HEREBY GIVES NOTICE that the Minister for Mines and Petroleum, C/- Department of Mines, Petroleum and Exploration, 100 Plain Street, East Perth WA 6004 may grant the following tenement applications under the *Mining Act 1978*:

Tenement Type	No.	Applicant	Area*	Locality	Centroid	Shire
Exploration Licence	36/1043	WESTERN AUSTRALIAN GOLD RESOURCES LIMITED	49BL	2.1km SE'ly of Leinster	Lat: 27° 56' S ; Long: 120° 42' E	LEONORA SHIRE
Exploration Licence	47/5309	FMG PILBARA PTY LTD	20BL	52.5km S'ly of Whim Creek	Lat: 21° 17' S ; Long: 117° 59' E	KARRATHA CITY, PORT HEDLAND TOWN
Mining Lease	77/1328	AURENNE PARKER RANGE PTY LTD	3.80HA	23.2km S'ly of Marvel Loch	Lat: 31° 39' S ; Long: 119° 34' E	YILGARN SHIRE

Nature of the act: Grant of mining leases, which authorises the applicant to mine for minerals for a term of 21 years from notification of grant and a right of renewal for 21 years. Grant of exploration licences, which authorises the applicant to explore for minerals for a term of 5 years from the date of grant.

Notification day: 24 September 2025

Native title parties: Under section 30 of the *Native Title Act 1993 (Cth)*, persons have until 3 months after the notification day to take certain steps to become native title parties in relation to applications. The 3 month period closes on **24 December 2025**. Any person who is, or becomes a native title party, is entitled to the negotiation and/or procedural rights provided in Part 2 Division 3 Subdivision P of *Native Title Act 1993 (Cth)*. Enquiries in relation to filing a native title determination application to become a native title party should be directed to the Federal Court of Australia, 1 Victoria Avenue, Perth WA 6000, telephone (08) 9268 7100. The mining tenements may be granted if, by the end of the period of 4 months after the notification day **(i.e. 24 January 2026)**, there is no native title party under section 30 of the *Native Title Act 1993 (Cth)* in relation to the area of the mining tenements.

For further information about the act (including extracts of plans showing the boundaries of the applications), contact the Department of Mines, Petroleum and Exploration, 100 Plain Street, East Perth WA 6004, or telephone (08) 9222 3518.

* - 1 Graticular Block = 2.8 km²

DMIRS 27943

Figure 1-23: Pilbara News, Notice of Public Comment—24 September 2025

pilbaranews.com.au Pilbara News September 24, 2025 — Page 19

Classifieds

Phone: 9482 2300 Place an ad: regionalclassifieds@wanews.com.au or go to pilbaranews.com.au

PUBLIC NOTICES

PUBLIC COMMUNITY NOTICE
Wild Dog Baiting Program in the Pilbara Region

The Pilbara Regional Biosecurity Group Inc. (PRBG) extends its notice to all residents and travellers within the Pilbara region. We would like to inform you about an upcoming community aerial and ground baiting program aimed at controlling wild dogs. This program will take place from September 7th to October 5th, 2025. Participating pastoralists on pastoral leases and the Department of Biodiversity, Conservation, and Attractions (DBCA) managed lands in the following Local Government areas: ASHBURTON, EAST PILBARA, PORT HEDLAND, and KARRATHA, will be implementing this program. Selected pastoral lands within the Local Government Area of BROOME are also included in this program.

We kindly request that you consider all designated land in the region to contain toxic baits throughout the year. When working within or visiting these areas, please exercise caution. Keep your domestic pets under close control and within a leash. As all roads in this region pass through pastoral leases or DBCA managed land, it is crucial to keep your pets close to avoid exposure to poison meat baits.

The 1080 baiting program forms an integral part of the wild dog pest management program, assisting landholders in meeting their legal obligations under the LAM Act 2007. Pastoralists undertake these measures to protect livestock from potential harm caused by wild dogs. Unfortunately, there is no antidote available for 1080 poisoning if domestic pets accidentally consume the baits.

For further information, please contact the Executive Officer of the Pilbara Regional Biosecurity Group Inc. on 0429 969 452 or at **ea@pilbarurbg.org.au**

Thank you for your attention and cooperation.

Pilbara Regional Biosecurity Group Inc.

Wandoo Field Exploration Drilling Environment Plan
NOTICE OF PUBLIC COMMENT

VERMILION ENERGY

Vermilion Oil and Gas Australia (VOGA) invites public comment on the Wandoo Field Exploration Drilling Environment Plan.

During the 30-day public comment period, interested parties can view and comment on the environmental management of the proposed activity, based on existing measures and controls outlined in the Environment Plan.

The Environment Plan is available on Vermilion's website (at the QR code) and the National Offshore Petroleum Safety Environmental Management Authority (NOPSEMA) website: **info.nopsema.gov.au/home/open_for_comment**

About the proposed activity

VOGA plans to continue producing from its existing permit area WA-14-L in Commonwealth waters within the Carnarvon Basin, about 80km northwest of the port of Dampier and 110km northeast of Barrow Island in Western Australia.

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in 2026-27. The Environment Plan will allow Vermilion to drill up to seven exploration wells.

The activity is scheduled to commence in 2026-27 with the exact timing dependent on the acceptance of the Environment Plan and the availability of a mobile offshore drilling unit.

Project Location

Submitting a comment

Comments can be submitted through NOPSEMA's online Consultation hub: **consultation.nopsema.gov.au**

Relevant comments should relate to the environmental approvals document. Where new information should be considered, supporting documents such as data, scientific reports, or maps are encouraged and can be uploaded via the online platform.

For more information

Email: ate-consultation@vermilionenergy.com

Website: vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

To visit our website, scan the QR code

City of Karratha
Notice of Road Reserve Dedication

Published on 24th September 2025

Notice is hereby given pursuant to the provision of Section 56 of the Land Administration Act 1997 Council intends to dedicate portions (as shown on corresponding maps) of the following land parcels as public road:

Dampier Road and Prancing Avenue Intersection
Land ID Number: 4068569 (Lot 9220)
Land ID Number: 4068574 (Lot 877)
Land ID Number: 3811544 (Lot 516)
Land ID Number: 4029478 (Lot 734)
Land ID Number: 3750878 (Lot 516)

Madigan Road and Wagait Drive Intersection
Land ID Number: 4524891 (Lot 6508)

Mourson Cove Road
Land ID Number: 3857909 (Lot 538)

Details of the proposal are available for inspection at the City of Karratha Administration Office at Lot 1083 Welcome Road, Karratha, during office hours, or at https://karratha.wa.gov.au/council/plans-publications-and-policies/public-notifications

Submissions should be made in writing to the City of Karratha, PO Box 219, Karratha WA 6714 or via email to submissions@karratha.wa.gov.au on or before **4:30 pm Wednesday 29 October 2025.**

Virginia Millrup
Chief Executive Officer

TENDERS

TENDER NOTICE

PILBARA PORTS

REQUEST FOR TENDER (RFT) FOR
LUMSDEN POINT – WORK PACKAGE 16 – PROCUREMENT OF SWITCH ROOMS, RING MAIN UNIT SUBSTATIONS AND TRANSFORMERS AT LUMSDEN POINT, PORT HEDLAND

Tender Reference T15/25

Interested parties are invited to tender for the provision Switch rooms, Ring Main Unit Substations and Transformers at Pilbara Ports Lumsden Point development at the Port of Port Hedland.

The works required includes carrying out the detailed design, procurement, fabrication, factory acceptance testing of long lead power reticulation components, and delivery of components to the Lumsden site for installation by others. The RFT will be structured to allow Tenderers the ability to bid on the whole tender package, or part of the tender package.

Tender documents are available for download from the TendersWA website at the following address: **www.tenders.wa.gov.au** and contain additional detail on the RFT process and the works.

Interested parties are required to register on the TendersWA website to be able to download and resolve the tender documents and lodge submissions.

There will be a mandatory Tender briefing at **10:30am WAST on Friday 26 September 2025** further details of which can be found in the Tender documents.

For any assistance or questions relating to this tender,
Procurement Specialist – Lumsden - Rebecca Williamson +61 457 225 125 or rebecca.williamson@pilbaraports.com.au.

Tenders must be lodged electronically on the TendersWA website.

Tenders close at **3:00pm WAST on Friday 17 October 2025** and no tenders will be able to be lodged after this time.

Pilbara Ports is not obliged to enter into any contractual arrangements with any interested party as a result of this Tender process. Pilbara Ports is not obliged to accept the lowest or any tender.

www.pilbaraports.com.au | feedback@pilbaraports.com.au | 1300 100 772

ADULT SERVICES

Figure 1-24: The Australian, Notice of Public Comment—24 September 2025

THE AUSTRALIAN WEDNESDAY, SEPTEMBER 24, 2025

Nvidia backstopping AI boom

Jensen Huang has sought to leverage the enormous confidence investors have in Nvidia

Judge mulls remedy to Google's ad power

NOTICES

www.theaustralian.com.au

NOTICE TO CREDITORS

Lamb Weston Australia Holdings Pty Ltd ACN 629 687 270, Tuber Investments Pty Ltd ACN 621 731 913, Marvel Packers Pty Ltd ACN 097 224 612, Tuber Holdings Pty Ltd ACN 621 725 380, Lamb Weston Victoria Pty Ltd ACN 641 663 890, Food Coatings Australia Pty Ltd ACN 670 441 699 and Lamb Weston Australia Pty Ltd ACN 634 083 046 (previously named 'Harvest Choice Australia Pty Ltd' in the Deed of Cross Guarantee) (together, **Companies**) are parties to a deed of cross guarantee dated 11 March 2020, as varied by an Assumption Deed dated 22 October 2020 and an Assumption Deed dated 16 April 2024 (**Deed of Cross Guarantee**)

Lamb Weston Australia Holdings Pty Ltd ACN 629 687 270, Tuber Investments Pty Ltd ACN 621 731 913, Marvel Packers Pty Ltd ACN 097 224 612, Tuber Holdings Pty Ltd ACN 621 725 380, Lamb Weston Victoria Pty Ltd ACN 641 663 890, Food Coatings Australia Pty Ltd ACN 670 441 699 and Lamb Weston Australia Pty Ltd ACN 634 083 046 (previously named 'Harvest Choice Australia Pty Ltd' in the Deed of Cross Guarantee) (together, **Companies**) are parties to a deed of cross guarantee dated 11 March 2020, as varied by an Assumption Deed dated 22 October 2020 and an Assumption Deed dated 16 April 2024 (**Deed of Cross Guarantee**)

The Revocation Deeds have been lodged with the Australian Securities and Investments Commission.

Wandoo Field Exploration Drilling Environment Plan
NOTICE OF PUBLIC COMMENT

VERMILION ENERGY

Vermilion Oil and Gas Australia (VOGA) invites public comment on the Wandoo Field Exploration Drilling Environment Plan.

During the 30-day public comment period, interested parties can view and comment on the environmental management of the proposed activity, based on existing measures and controls outlined in the Environment Plan.

The Environment Plan is available on Vermilion's website (at the QR code) and the National Offshore Petroleum Safety Environmental Management Authority (NOPSEMA) website: info.nopsema.gov.au/home/open_for_comment

About the proposed activity

VOGA plans to continue producing from its existing permit area WA-44-L in Commonwealth waters within the Carnarvon Basin, about 80km northwest of the port of Dampier and 145km northeast of Barrow Island in Western Australia.

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one new/infill exploration well in 2026–27. The Environment Plan will allow Vermilion to drill up to seven exploration wells.

The activity is scheduled to commence in 2026–27 with the exact timing dependent on the acceptance of the Environment Plan and the availability of a mobile offshore drilling unit.

Project Location

Submitting a comment

Comments can be submitted through NOPSEMA's online Consultation Hub: consultation.nopsema.gov.au

Relevant comments should relate to the environmental approvals document. Where new information should be considered, supporting documents such as data, scientific reports, or maps are encouraged and can be uploaded via the online platform.

Post more information

To visit our website, scan the QR code

Notice of Publication of Draft Public Environment Report
Invitation for Public Comment
Moah Creek Wind Farm
EPBC 2023/09620

The following notice is published pursuant to Section 98(1)(c) of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Moah Creek Wind Farm Project Co Pty Ltd (as trustee for Moah Creek Wind Farm Project Trust) (the Proponent) proposes to construct, operate and decommission the Moah Creek Wind Farm Project (the Project). This will involve up to 60 wind turbine generators and associated ancillary infrastructure. The Project is located 30km west of Rockhampton, 10km north-west of Stanwell, in the Rockhampton Regional Council area of Queensland.

The Project (EPBC 2023/09620) was determined a controlled action under the EPBC Act with assessment by Public Environment Report. The controlling provisions are:

- Listed threatened species and communities (section 18 & section 18A, EPBC Act)
- Listed migratory species (section 20 & section 20A, EPBC Act)

Pursuant to section 98(1)(c) of the EPBC Act, the draft Public Environment Report is available for public viewing for no cost online at www.moahcreek.com/news , or in hard copy at the following locations:

Gracemere Library - 1 Ranger Street, Gracemere Qld 4702
Rockhampton Southside Library – 230 Bolsover Street, Rockhampton Qld 4702
State Library of Queensland – Stanley Place, South Brisbane Qld 4101

The draft Public Environment Report may be obtained from the Proponent in digital format at no cost, upon request, using the contact details below.

Interested persons and organisations are invited to submit comments in writing on the draft Public Environment Report via:

Post:

Moah Creek Wind Farm Project Co Pty Ltd
Suite 6.01, Level 6, 165 Walker Street
North Sydney NSW 2060

Email: info@moahcreek.com

The public comment period is for 20 business days and commences on 24th **September 2025** and closes on 24th **October 2025**. All times are Australian Eastern Standard Time.

Persons with special needs (including those for whom English is a second language or those with a vision impairment) may contact the Proponent for assistance in accessing the documentation on +61 467 188 430 or email info@moahcreek.com

1.4 Consultation Report

1.4.1. Summary Consultation Report

Consultation activities undertaken with relevant persons or organisations are summarised in Table 6 and engagement activities undertaken with persons or organisations VOGA assessed as not relevant but chose to contact are summarised in Table 7.

Table 6: Consultation Report with Relevant Persons or Organisations

Section 25(1)(a) of the OPGGS(E)R: Departments or agencies of the Commonwealth to which the activities to be carried out under the environment plan may be relevant			
Commonwealth Government Departments and Agencies			
Australian Border Force (ABF) (Maritime Border Command)			
Consultation overview and summary of response on this EP			
• On 2 December 2024, VOGA advised the ABF by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information. • On 13 January 2025, VOGA emailed ABF following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite a follow-up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that ABF has no comment at this time.	VOGA considers the measures and controls in the EP address ABF's functions, interests or activities.
Consultation demonstration statement			
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with ABF for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:			

Sufficient Information

- Consultation information provided to ABF on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (see Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- In accordance with NOPSEMA's guideline for engaging with Commonwealth government departments or agencies, VOGA consulted with ABF via email.
- VOGA sent a follow-up consultation email on 13 January 2025, reminding ABF of the opportunity to provide feedback.

Australian Fisheries Management Authority (AFMA)

Consultation overview and summary of response on this EP

- On 14 November 2024, VOGA called AFMA; the call went unanswered and VOGA left a voicemail requesting a follow up call (SI Report, reference 1.1.1).
- On 14 November 2024, VOGA emailed AFMA to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.19).
    - VOGA sought AFMA's input on the preferred method of consultation with commercial fisheries and aims to ensure the engagement is tailored to meet their needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 18 November 2024, AFMA called VOGA and outlined the correct contact details for further consultation (SI Report, reference 1.1.2).
- On 19 November 2024, AFMA emailed VOGA, confirmed it wished to be further consulted, and shared its preferred contact email (SI Report, reference 1.1.3).
    - AFMA advised that the proposed activities can potentially interact with the Western Tuna and Billfish Fishery.
    - AFMA advised that consultation should be conducted with the Commonwealth Fisheries Association (CFA), Seafood Industry Australia (SIA), and Tuna Australia.
- On 27 November 2024, VOGA emailed AFMA requesting information regarding the consultation requirements for Commonwealth commercial fisheries

(SI Report, reference 1.1.4).
    - VOGA confirmed that it would make contact and engage with the relevant industry associations as requested by AFMA.
- On 28 November 2024, AFMA emailed VOGA confirming the requirements for Commonwealth commercial fishery consultation (SI Report, reference 1.1.5).
    - AFMA outlined that they do not speak for or represent the Commonwealth Fishing Industry.
- On 2 December 2024, VOGA advised AFMA by email of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information Sheet (Record of Consultation, reference 3.2, 1.1 and 1.2).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; the location and timing of activities; an outline of the activities to be conducted; a list of relevant state and Commonwealth-managed fisheries and an overview of consultation plans within the Operational Area and the EMBA.
    - VOGA acknowledged AFMA's consultation guidance and advised it had consulted with fishing industry associations directly and has applied this by consulting with relevant fishing industry associations for commercial fisheries identified as having potential for interaction in the operational area and EMBA.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
AFMA requested that VOGA consult with relevant fishing stakeholders, including CFA, SIA and Tuna Australia	VOGA addressed AFMA's request to consult with CFA, SIA, and Tuna Australia and advised that it had consulted with the associations directly.	VOGA has consulted relevant fishing industry associations in preparing this EP.	VOGA has assessed the potential for interaction with Commonwealth fisheries and has notified CFA, SIA and Tuna Australia as well as ASBITA and PPA, at its discretion.

AFMA provided requirements for consultation with Commonwealth fisheries	VOGA acknowledged AFMA's consultation guidance.	VOGA has undertaken AFMA's consultation guidance for Commonwealth fisheries.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
While feedback has been received, there were no objections or claims on this EP.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA accepts that AFMA has no further comment at this time.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with AFMA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Initial outreach and consultation information provided to AFMA on 14 November 2024, to inform of upcoming activities based on AFMA's function, interests and activities.
- Consultation information provided to AFMA on 2 December 2024 based on their function, interest and activities.

Reasonable Period

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- Commercial Fisher Information Sheet has been provided to stakeholders and publicly available on the VOGA website since December 2024.
- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to AFMA over a two-month period.

Reasonable Opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025, advising of the proposed activities and requesting consultation from relevant persons.

- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- In line with NOPSEMA's guideline for engagement with Commonwealth government departments or agencies, VOGA used email for its consultation with AFMA.

Australian Hydrographic Office (AHO)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA emailed the AHO advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.7 and 1.1).
  - The email included an activity summary, a shipping lane map (Record of Consultation, reference 3.7.1), directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 3 December 2024, AHO emailed VOGA and reported it had no concerns with the activities associated with the EP (SI Report, reference 1.2.1).
  - The email requested that further updates be provided to the AHO once activities are due to begin.
- On 17 December 2024, VOGA emailed AHO and thanked it for its response (SI Report, reference 1.2.2).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
AHO has requested VOGA provide updates on the activities once the proposed activities are due to begin.	VOGA noted and actioned AHO's advice.	VOGA notes that the AHO's notification requirements will be incorporated into the relevant sections of this EP.	VOGA will notify the AHO once activities are due to begin.

AHO advised it has no concerns with the activities associated with this EP. While feedback has been received, there were no objections or claims on this EP.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).		VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with AHO for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to AHO on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable Period

- A consultation period was notified in the initial consultation correspondence and consultation material sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to AHO over a one-month period.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- In line with NOPSEMA's guideline for engagement with Commonwealth government departments or agencies, VOGA used email for its consultation with AHO.

Australian Maritime Safety Authority (AMSA) – maritime safety			
Consultation overview and summary of response on this EP			
• On 2 December 2024, VOGA emailed AMSA advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.7 and 1.1). o The email included an activity summary, a shipping lane map (Record of Consultation, reference 3.7.1), directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 18 December 2024, AMSA emailed VOGA advising of the consultation outreach receipt and requested that AHO be notified of any activities four weeks prior to commencement (SI Report, reference 1.3.1). o The email also included: ▪ A vessel traffic plot for the locality surrounding the project (SI Report, reference 1.3.1.1). ▪ Details for the requirements of vessels used at the project and the spacial@AMSA portal. ▪ A request to contact AMSA's Rescue Centre (ARC) and Joint Rescue Coordination Centre (JRCC) at least 24-48 hours before operations commence. • On 19 December 2024, VOGA emailed AMSA to confirm the receipt of the response and thanked AMSA for the information (SI Report, reference 1.3.2). o VOGA noted and reviewed the vessel traffic plot and acknowledged the presence of vessel traffic in the area during the activities. o VOGA confirmed it would notify AMSA, ARC, and JRCC before operations commence, ensure vessels comply with the International Rules for Preventing Collisions at Sea (COLREG) regulations and evaluate and implement adequate anti-collision measures.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
AMSA has requested the AHO be notified of any activities four weeks prior to commencement.	VOGA will notify AMSA in advance of operations commencing and will notify AHO four weeks prior to commencement.	VOGA has addressed AMSA's requests and proposed notification protocols for the ongoing nature of the activities during this EP.	VOGA will notify the AHO of any activities four weeks prior to commencement (Section 7, Table 7-2, CM-1.4).

AMSA requested that their Rescue Centre (ARC) and Joint Rescue Coordination Centre (JRCC) be notified 24-48 hours before operations commence, as well as provide all of the details for relevant vessels.	VOGA will notify ASMA's ARC and JRCC 24-48 hours before operations commence, and follow the advice provided.	VOGA has addressed AMSA's requests and proposed notification protocols for the ongoing nature of the activities during this EP.	VOGA will notify the Rescue Centre (ARC) and Joint Rescue Coordination Centre (JRCC) 24-48 hours before operations commence, as well as provide all of the details for relevant vessels (Section 7, Table 7-2, CM-1.4).
AMSA requested vessels comply with COLREG regulations, including implementation of adequate anti-collision measures.	VOGA will also ensure all vessels comply with COLREG regulations.	VOGA has addressed AMSA's requests and proposed notification protocols for the ongoing nature of the activities during this EP.	VOGA will ensure vessels comply with COLREG regulations, including implementation of adequate anti-collision measures (Section 7, Table 7-2, CM-1.3).
While feedback has been received, there were no objections or claims on this EP.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA accepts that AMSA has no further comment at this time.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with AMSA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to AMSA on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable Period** • A consultation period was notified in the initial consultation correspondence and consultation material sent. • Consultation for this EP commenced in December 2024. • VOGA has addressed and responded to AMSA over a one-month period. **Reasonable Opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • In line with NOPSEMA's guideline for engagement with Commonwealth government departments or agencies, VOGA used email for its consultation with AMSA.

Australian Maritime Safety Authority (AMSA) – marine pollution			
Consultation overview and summary of response on this EP			

• On 2 December 2024, VOGA emailed AMSA advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.7 and 1.1).
  ○ The email included an activity summary, a shipping lane map (Record of Consultation, reference 3.7.1), directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
• On 13 March 2025, VOGA emailed AMSA (marine pollution) following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.21 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that AMSA has no comment at this time.	VOGA considers the measures and controls in the EP address AMSA's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with AMSA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to ASMA on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • In accordance with NOPSEMA's guideline for engaging with Commonwealth government departments or agencies, VOGA consulted with AMSA via email. • VOGA sent follow-up consultation emails on 13 January 2025, reminding AMSA of the opportunity to provide feedback.
Department of Agriculture, Forestry and Fisheries (DAFF) – Biosecurity (marine pests) (vessels, aircraft and personnel)
Consultation overview and summary of response on this EP

• On 3 December 2024, VOGA emailed DAFF - Biosecurity advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.14 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  ○ The email also included VOGA's assessment of biosecurity risks, including:

- An environmental description and assessment
- Invasive marine species prevention controls

- On 13 January 2025, VOGA emailed DAFF following up on the proposed activity and provided information on biosecurity matters and a Consultation Information Sheet (Record of Consultation, reference 4.4 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
  - The email also provided VOGA's analysis of biosecurity matters as supplied on 3 December 2024.
- On 15 January 2025, DAFF emailed VOGA to thank them for their outreach and confirm that the activities do not affect the Conveyance policy team (SI Report, reference 1.4.1).
- On 17 January 2025, VOGA emailed DAFF to confirm receipt and thank them for their response (SI Report, reference 1.4.2).

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
While feedback has been received, there were no objections or claims on this EP.	VOGA notes advice that the proposed activities have no impact on DAFF's functions. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA accepts that there are no objections or claims on this EP by DAFF.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DAFF for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to DAFF on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was notified in the initial consultation correspondence and consultation material sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to DAFF over a two-month period.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- In line with NOPSEMA's guideline for engagement with Commonwealth government departments or agencies, VOGA used email for its consultation with DAFF.

Department of Agriculture, Forestry and Fisheries (DAFF) – Fisheries

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed DAFF - Fisheries advising of the proposed activity and provided a Consultation Information Sheet and a Commercial Fisher Information Sheet (Record of Consultation, reference 3.13, 1.1 and 1.2).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The email included specific information for the commercial fishing sector in addition to the information sheet attachment.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher Information Sheet included an overview of the proposed activities; key information for the commercial fishing sector about the activities; coordinates for operational areas; an activity summary; assessment of commercial fishing, potential effects and impacts; and VOGA's impact assessment.
- On 13 January 2025, VOGA emailed DAFF following up on the proposed activity and provided a Consultation Information Sheet and Commercial Fishing Information Sheet (Record of Consultation, reference 4.3, 1.1 and 1.2).
    - The email included an activity summary, information for the commercial fishing sector, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
    - The email also provided information for the commercial fishing sector as supplied on 3 December 2024

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that DAFF has no comment at this time.	VOGA considers the measures and controls in the EP address DAFF's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DAFF for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to DAFF on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- Commercial Fisher Information Sheet has been provided to stakeholder and publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- In accordance with NOPSEMA's guideline for engaging with Commonwealth government departments or agencies, VOGA consulted with DAFF via email.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding DAFF of the opportunity to provide feedback.

Department of Climate Change, Energy, the Environment and Water (DCCEEW) – Underwater Cultural Heritage (UCH)
Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed DCCEEW advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.15 and 1.1).
    - The email included an activity summary, VOGA's assessment of underwater cultural heritage, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The email also advised that VOGA had contacted the Western Australian Museum and Department of Planning, Lands and Heritage (DPLH) as part of consultation for this EP.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The email also included VOGA's assessment of underwater cultural heritage, including an analysis of any cultural heritage artifacts identified within the Operational Area or EMBA.
- On 13 January 2025, VOGA emailed DCCEEW following up on the proposed activity and provided VOGA's assessment of underwater cultural heritage, and a Consultation Information Sheet (Record of Consultation, reference 4.6 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
    - The email also provided VOGA's analysis of underwater cultural heritage as supplied on 3 December 2024.
- On 17 January 2025, DCCEEW emailed VOGA, thanking them for the opportunity to consult and noting that VOGA was aware of the Underwater Cultural Heritage Act 2018 (UCH Act) requirements and had notified the relevant groups (SI Report, reference 1.5.1).
    - The email referenced the Australasian Cultural Heritage Database (AUCHD) as a tool for assessing located UCH sites, and recommended that VOGA consider the tool and develop appropriate mitigation measures if relevant.
    - The email also included a summary of the UCH Act protections, key responsibilities and obligations, and management considerations and recommendations. This included guidelines for any planned assessment activities and ongoing monitoring.
    - The email also advised that the Minister would need to be notified within 21 days of a discovery, and that reporting would need to be done through the notification of discovery functionality in the AUCHD tool.
- On 14 February 2025, VOGA emailed DCCEEW to thank them for their consultation and advice, and to thank them for advising on AUCHD to assess located UCH sites (SI Report, reference 1.5.2).
    - The email acknowledged that potential unlocated UCH may be present in the study areas and that this would be considered when planning for this EP. VOGA acknowledged the legislation and protections as outlined in the *UCH Act 2018*, and outlined the obligations of VOGA including:
        - The relevant UCH legislation
        - All actions will be compliant with the relevant legislation
        - That there is no adverse impact to protected UCH without a permit

- That in the event of suspected UCH that VOGA will notify the Minister of the discovery through the notification of discovery functionality in the AUCHD tool within 21 days of discovery.
- VOGA also provided information regarding the approach to this EP and clarified that it had engaged with Traditional Owners and Prescribed Body Corporates to gather input on environmental and cultural sensitivities. VOGA confirmed that local area consultation notices and advertisements had been undertaken to encourage participation from interested parties.
- VOGA thanked DCCEEW for their advice regarding seeking expert advice from a qualified and experienced underwater archaeologist, and that VOGA would take geophysical mapping of the seafloor during survey activities and investigate the assessment of these maps by the underwater archaeologist.

- On 15 May 2025, VOGA emailed DCCEEW to clarify known historical shipwrecks in the project EMBA (SI Report, reference 1.5.3).
  - VOGA corrected the previous statement that there were 31 historical wrecks within 100km of the EMBA, by providing the updated figure of 38 shipwrecks and shipwreck artifacts within the EMBA.
  - VOGA also clarified that there are no shipwrecks or artifacts located within the Operational Area, and clarified the nearest shipwreck.
  - VOGA also provided a table in the email, sourced from this EP, which outlines all the historical wrecks within the project EMBA. (SI Report, reference 1.5.3.1)
  - The email also clarified that WAM and DPLH had been contacted regarding the updated figures.
  - VOGA also requested any feedback on the shipwreck information.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
DCCEEW provided feedback regarding the use of AUCHD for assessing located UCH sites and to use the tool to assess potential sites.	VOGA has noted DCCEEW's feedback for assessing the potential for unlocated UCH to be present in the study area.	VOGA has addressed DCCEEW's feedback by acknowledging the potential for unlocated UCH to be present in the study area.	The EP outlines the current assessment of UCH sites within the project EMBA and that there are no impacts to the values of any known underwater heritage or shipwrecks as a result of planned activities (Sections 3.6.3 and 5.2.3.1 of the EP). VOGA considers its current controls in accordance with the UCH Act.

DCCEEW provided feedback regarding the assessment of underwater cultural heritage.	VOGA has noted DCCEEW's advice on the legislation and protections as outlined in the UCH Act and the obligations of VOGA.	VOGA has addressed DCCEEW's feedback by acknowledging the legislation and protections as outlined in the UCH Act and the obligations of VOGA.	The EP outlines the current assessment of UCH sites within the project EMBA and that there are no impacts to the values of any known underwater heritage or shipwrecks as a result of planned activities (Sections 3.6.3 and 5.2.3.1 of the EP). VOGA considers its current controls in accordance with the UCH Act.
DCCEEW requested that VOGA notify the Minister within 21 days of a discovery through the AUCHD tool.	VOGA has noted the request to notify the Minister within 21 days of a discovery through the AUCHD tool.	VOGA has addressed DCCEEW's feedback by confirming the notification of the Minister within 21 days of a discovery through the AUCHD tool.	VOGA will notify the Minister within 21 days of a discovery through the AUCHD tool (Section 7, Table 7-2, CM-2.2).
DCCEEW advised that VOGA may want to seek out advice from an underwater archaeologist and undertake geophysical mapping of the seafloor during activities. While feedback has been received, there were no objections or claims on this EP.	VOGA has noted the request to hire an underwater archaeologist.	VOGA has addressed DCCEEW's feedback by acknowledging DCCEEW's recommendation to hire an underwater archaeologist. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DCCEEW for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to DCCEEW on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable Period** • A consultation period was notified in the initial consultation correspondence and consultation material sent. • Consultation for this EP commenced in December 2024. • VOGA has addressed and responded to DCCEEW over a three-month period. **Reasonable Opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • In line with NOPSEMA's guideline for engagement with Commonwealth government departments or agencies, VOGA used email for its consultation with DCCEEW.

Department of Defence (DoD)			
Consultation overview and summary of response on this EP			
• On 2 December 2024, VOGA emailed the DoD advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.10 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. o The email also included VOGA's assessment of impacts or risks to defence for this EP, including: ▪ An assessment of defence related uses in the Operational Area and EMBA ▪ It concluded there are no unexploded ordnance (UXO) potential in the Operational Area. • On 13 January 2025, VOGA emailed DoD following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.5 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP. o The email also provided VOGA's analysis of defence-related issues as supplied on 2 December 2024.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that DoD has no comment at this time.	VOGA considers the measures and controls in the EP address DoD's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DoD for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to DoD on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • In accordance with NOPSEMA's guideline for engaging with Commonwealth government departments or agencies, VOGA consulted with DoD via email. • VOGA sent follow-up consultation emails on 13 January 2025, reminding DoD of the opportunity to provide feedback.

Department of Industry, Science and Resources (DISR)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA advised DISR by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information.
- On 13 January 2025, VOGA emailed DISR following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that DISR has no comment at this time.	VOGA considers the measures and controls in the EP address DISR's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DISR for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to DISR on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.

- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- In accordance with NOPSEMA's guideline for engaging with Commonwealth government departments or agencies, VOGA consulted with DISR via email.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding DISR of the opportunity to provide feedback.

Director of National Parks (DNP)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA emailed the DNP advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.8 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The email also included VOGA's assessment of relevant marine parks, including:
        - An analysis of what marine parks may be situated within the Operational Area or nearby
        - An assessment of potential risks to Australian Marine Parks
        - A list of Australian Marine Parks within the project EMBA
        - A NOPSEMA-approved oil spill response plan and a list of parks within the EMBA that will be contacted in the event of a spill following a review of hydrocarbon spill modelling.
- On 12 December 2024, DNP emailed VOGA and clarified that planned activities do not overlap Australian Marine Parks. DNP confirmed that no authorisation is needed from the DNP (SI Report, reference 1.6.1).
    - The email provided further information on titleholder requirements, the North-west Network Management Plan, and information for potential emergency responses.
    - DNP confirmed that it should be made aware of any oil or gas pollution incidences which occur within a marine park, and provided contact details for the officer to contact, as well as details on what any notification should include.
- On 18 December 2024, VOGA emailed DNP to thank them for their response and the information provided (SI Report, reference 1.6.2).

○ The email confirmed that VOGA will contact DNP if details regarding the activity change and result in an overlap with or new impact to a marine park, or for emergency responses. ○ VOGA also noted the DNP's confirmation that planned activities do not overlap with any Australian Marine Parks.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
DNP confirmed that the activity does not overlap any Australian Marine Park.	VOGA noted DNP's confirmation of no activity overlap with Australian Marine Parks.	VOGA confirmed that no activities are set to overlap marine parks.	AMPs are assessed in Section 3.6.4 of the EP.
DNP confirmed that no authorisation is required for this activity.	VOGA noted that there were no requirements from the DNP at this time.	VOGA noted that there were no requirements from the DNP at this time.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
DNP requested an update should the operational area change.	VOGA noted DNP's request for contact regarding any activity change and will notify the Marine Compliance Duty Officer within 24 hours of any spill.	VOGA confirmed that it will contact the DNP regarding any activity change.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
DNP requested that the 24 hour Marine Compliance Duty Officer be notified of any spill or pollution. While feedback has been received, there were no objections or claims on this EP.	VOGA noted DNP's request to notify the Marine Compliance Duty Officer within 24 hours of any spill.	VOGA confirmed that it will notify the Marine Compliance Duty Officer within 24 hours of any spill.	VOGA will notify DNP of any spill associated with this EP (Section 7, Table 7-2, CM-10.1) (Section 10, Table 10.4).

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DNP for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to DNP on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was notified in the initial consultation correspondence and consultation material sent. • Consultation for this EP commenced in December 2024. • VOGA has addressed and responded to DNP over a one-month period. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • In line with NOPSEMA's guideline for engagement with Commonwealth government departments or agencies, VOGA used email for its consultation with DNP

Section 25(1)(a) and (b) of the OPGGS(E)R: Departments or agencies of Western Australia to which the activities to be carried out under the environment plan may be relevant.			
State Government Departments and Agencies			
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS)			
Consultation overview and summary of response on this EP			
• On 2 December 2024, VOGA advised DEMIRS by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information. • On 13 January 2025, VOGA emailed DEMIRS following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that DEMIRS has no comment at this time.	VOGA considers the measures and controls in the EP address DEMIRS's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DEMIRS for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to DEMIRS on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding DEMIRS of the opportunity to provide feedback. • In line with NOPSEMA's guideline for engagement with State government departments or agencies, VOGA used email for its consultation with DEMIRS.
Department of Planning, Lands and Heritage (DPLH)
Consultation overview and summary of response on this EP

• On 3 December 2024, VOGA emailed DPLH advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.16 and 1.1).
  ○ The email included an activity summary, VOGA's assessment of underwater cultural heritage and historical wrecks, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  ○ The email also included VOGA's assessment of underwater cultural heritage, including an analysis of any cultural heritage artifacts identified

within the Operational Area or EMBA.
    - The email also advised that VOGA had contacted the Western Australian Museum and the Department of Climate Change, Energy, The Environment, and Water as part of the consultation outreach.
- On 13 January 2025, VOGA emailed DPLH following up on the proposed activity and provided VOGA's assessment of underwater cultural heritage, and a Consultation Information Sheet (Record of Consultation, reference 4.7 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
    - The email also provided VOGA's analysis of underwater cultural heritage as supplied on 3 December 2024.
- On 17 March 2025, DPLH emailed VOGA with an automatic reply, confirming that previous consultation had been received, and that a representative from DLPH would respond in due course (SI Report, reference 2.1.1).
- On 15 May 2025, VOGA emailed DPLH to clarify known historical shipwrecks in the project EMBA (SI Report, reference 2.1.2).
    - VOGA corrected the previous statement that there were 31 historical wrecks within 100km of the EMBA, by providing the updated figure of 138 shipwrecks and shipwreck artifacts within the EMBA.
    - VOGA also clarified that there are no shipwrecks or artifacts located within the Operational Area, and clarified the nearest shipwreck.
    - VOGA also provided a table in the email, sourced from this EP, which outlines all the historical wrecks within the project EMBA. (SI Report, reference 2.1.2.1)
    - The email also clarified that WAM and DCCEEW had been contacted regarding the updated figures.
    - VOGA also requested any feedback on the shipwreck information.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that DLPH has no comment at this time.	VOGA considers the measures and controls in the EP address DLPH's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DPLH for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to DPLH on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding DPLH of the opportunity to provide feedback. • In line with NOPSEMA's guideline for engagement with State government departments or agencies, VOGA used email for its consultation with DPLH.

Department of Biodiversity, Conservation and Attractions (DBCA)
Consultation overview and summary of response on this EP
• On 2 December 2024, VOGA advised DBCA by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information. • On 13 January 2025, VOGA emailed DBCA following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP. • On 16 January 2025, DBCA emailed VOGA thanking them for the consultation information and provided comments for consideration (SI Report, reference 2.2.1). o The email outlined considerations for marine parks and conservation reserves located within the project EMBA, including the importance of values and documentation prior to activities being conducted. DBCA requested the following: ▪ VOGA establish baseline survey data on current contamination and ecological values within the EMBA, as well as a risk assessment and information on threatened and protected fauna. ▪ VOGA assesses what baseline information may be required and determine suitable methods to identify information to ensure the impacts on ecological values are monitored and remediated. This includes a before-after, control-impact (BACI) framework in planning and evaluating VOGA's management response. ▪ In the event of a hydrocarbon release, it is requested that VOGA notify DBCA's Pilbara regional office. o DBCA referred VOGA to: ▪ The DCCEEW *National Light Pollution Guidelines for Wildlife* as a best-practice industry standard for managing potential impacts of light pollution on marine fauna. ▪ The DoT marine pollution website information and Offshore Petroleum Industry Guidance Note of July 2020 titled *Marine Oil Pollution: Response and Consultation Arrangements* for WA emergency management arrangements for marine oil pollution incidents. o The email confirmed contact information for all future notifications and consultations. • On 14 February 2025, VOGA emailed DBCA, thanking them for their advice regarding this EP and guidance on ecologically significant areas in the EMBA (SI Report, reference 2.2.2). In the email, VOGA: o Confirmed that the ecologically important areas had been assessed as part of this EP and that VOGA maintains an understanding of ecological importance within and adjacent to the operational areas and EMBA.

- Outlined an assessment of potential management and mitigation measures that had been considered in this EP, and all relevant controls had been adopted to reduce the impact to as low as reasonably practical (ALARP).
- Outlined that in accordance with the OPGGS(E)R 21(1) - (7), VOGA included details of the particular values and sensitivities of the environment within and in proximity to operational areas and the EMBA for impact assessment and risk evaluation.
- VOGA acknowledged its plans are in accordance with industry best practice standards for managing potential impacts of light pollution on marine fauna and confirmed it referred to the DCCEEW Guidelines.
- VOGA confirmed that as per the Oil Pollution Emergency Plan (OPEP), that in the event of an oil spill where marine wildlife is potentially impacted, VOGA will notify DBCA's Pilbara regional office.
  - VOGA noted that DBCA will not implement an oiled wildlife management response on behalf of a petroleum operator.
  - VOGA also advised that it has referred to guidance from the Department of Transport (DoT) and has consulted with the DoT – marine pollution as the jurisdictional authority while developing the OPEP.

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
DBCA provided guidance on ecologically important areas within the EMBA, including marine parks in the vicinity of the proposed operations, and requested that baseline values and potentially affected environment areas be documented prior to any operations commencing.	VOGA acknowledged that areas of ecological importance should be assessed and that baseline values should be documented prior to operations.	VOGA confirmed that areas of ecological importance have been assessed as part of this EP's development. VOGA maintains a baseline understanding of areas of ecological importance within and adjacent to the operational areas and EMBA.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
DBCA requested that VOGA acquire the relevant information to implement a Before-After, Control-Impact (BACI) framework.	VOGA acknowledged that a baseline understanding of ecological importance is important, and that VOGA follows the BACI framework.	VOGA confirmed an assessment of potential management and mitigation measures was considered in this EP to reduce the impact to ALARP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

DBCA recommended light pollution guidelines.	VOGA acknowledged that the light pollution claim has merit.	VOGA's plans are in accordance with industry best practice standards for managing light pollution on marine fauna (See Section 5.6.3.1 of the EP).	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
DBCA requested VOGA contact DBCA's Pilbara regional office in the event of a hydrocarbon release.	VOGA acknowledged the request to contact DBCA's regional office in the event of a hydrocarbon release.	VOGA confirmed that it will contact DBCA's Pilbara regional office in the event of a hydrocarbon release.	VOGA will notify DBCA of any hydrocarbon release associated with this EP (Section 7, Table 7-2, CM-10.1) (Section 10, Table 10.4).
DBCA requested VOGA refer to the DoT web content and an offshore industry guidance note for WA marine oil pollution. While feedback has been received, there were no objections or claims on this EP.	VOGA acknowledgedthe request to refer to the DoT information and industry guidance note. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA confirmed it has referred to the DoT's web content regarding marine pollution and has consulted with the DoT while developing the OPEP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
Consultation demonstration statement			
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DBCA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to DBCA on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024.			

- A consultation period was noted in the initial consultation correspondence and consultation material sent.

Reasonable period

- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to DBCA over a three-month period.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- In line with NOPSEMA's guideline for engagement with State government departments or agencies, VOGA used email for its consultation with DBCA.

Department of Primary Industries and Regional Development (DPIRD) – Fisheries

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA emailed DPIRD advising of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information Sheet (Record of Consultation, reference 3.9, 1.1 and 1.2).
    - The email included an activity summary, information for the commercial fishing sector, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher Information Sheet included an overview of the proposed activities; key information for the commercial fishing sector about the activities; coordinates for operational areas; an activity summary; assessment of commercial fishing, potential effects and impacts; and VOGA's impact assessment.
- On 13 January 2025, VOGA emailed DPIRD following up on the proposed activity, provided information for the commercial fishing sector and provided a Consultation Information Sheet and Commercial Fishing Information Sheet (Record of Consultation, reference 4.8, 1.1 and 1.2).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
    - The email also provided information for the Commercial Fishing Sector as supplied on 2 December 2024.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that DPIRD has no comment at this time.	VOGA considers the measures and controls in the EP address DPIRD's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DPIRD for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

- Consultation information provided to DPIRD on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Commercial Fisher Information Sheet was provided to DPIRD on 2 December 2024 based on their function, interest and activities.
- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding DPIRD of the opportunity to provide feedback.
- In line with NOPSEMA's guideline for engagement with State government departments or agencies, VOGA used email for its consultation with DPIRD.

Department of Transport (DoT) – marine pollution			
Consultation overview and summary of response on this EP			
• On 2 December 2024, VOGA advised DOT by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information. • On 6 December 2024, DoT emailed VOGA requesting consultation if there is a risk of a spill impacting state waters and referenced the guidance note "Marine Oil Pollution: Response and Consultation Arrangements (July 2020)" (SI Report, reference 2.3.1). • On 18 December 2024, VOGA emailed DoT, thanking them for their response and noting DoT's preferred approach for consultation. VOGA confirmed it would prepare the information in the requested format (SI Report, reference 2.3.2). • On 15 January 2025, VOGA emailed DoT to provide them with the information requested in the Guidance Note. VOGA provided an attachment with the information required (SI Report, reference 2.3.3 and 2.3.3.1). o The attached guidance note outlined the potential damages from spills following the proposed activities. It provided an overview of oil reactants and the opportunity for dispersant efficacy in the event of a spill. The document also provided details on response strategies and incident control arrangements. • On 24 March 2025, DoT emailed VOGA to thank them for providing the guidance note as per Appendix 6 of the Department of Transport Offshore Petroleum Industry Guidance Note (SI Report, reference 2.3.4). o DoT requested that any finalised submitted plans should be sent to DoT for their record-keeping.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
DoT requested that it be consulted if there is a risk of a potential spill impacting state waters from any proposed activity.	VOGA acknowledged DoT's request to be consulted in the event of any potential spill.	VOGA confirmed it will consult DoT in the event of any potential spill.	VOGA will consult DoT in the event of any potential spill.
DoT referred VOGA to the department's Petroleum Industry Guidance Note.	VOGA acknowledged and adopted DoT's notice of the department's Guidance Note as DoT's preferred method of consultation and information provision.	VOGA provided DoT with the information as requested in Appendix 6 of the Industry Guidance Note.	VOGA has provided DoT with the information as requested.

DoT thanked VOGA for suppling the information. While feedback has been received, there were no objections or claims on this EP.	VOGA accepts that DoT has no comment on the proposed activities. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA accepts that DoT has no comment at this time.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with DoT for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to DoT on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence and consultation material sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA has addressed and responded to DoT over a four-month period.
- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- In line with NOPSEMA's guideline for engagement with State government departments or agencies, VOGA used email for its consultation with DoT.

Ningaloo Coast World Heritage Advisory Committee (NCWHAC)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA advised NCWHAC by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information.
- On 13 January 2025, VOGA emailed NCWHAC following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that NCWHAC has no comment at this time.	VOGA considers the measures and controls in the EP address NCWHAC's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with NCWHAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to NCWHAC on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding NCWHAC of the opportunity to provide feedback.
- In line with NOPSEMA's guideline for engagement with State government departments or agencies, VOGA used email for its consultation with NCWHAC.

Pilbara Development Commission (PDC)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA advised PDC by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information.
- On 13 January 2025, VOGA emailed PDC following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that PDC has no comment at this time.	VOGA considers the measures and controls in the EP address PDC's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with PDC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to PDC on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding PDC of the opportunity to provide feedback.
- In line with NOPSEMA's guideline for engagement with State government departments or agencies, VOGA used email for its consultation with PDC.

Pilbara Ports Authority (PPA)			
Consultation overview and summary of response on this EP			
• On 2 December 2024, VOGA advised PPA by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information. • On 6 December 2024, PPA emailed VOGA stating that they had no comment or feedback regarding the proposed scope and environmental management (SI Report, reference 2.4.1). o The email requested that PPA be notified if any unplanned event occurs due to the EMBA overlapping with the operational Port at Varanus Island. • On 11 December 2024, VOGA emailed PPA confirming the receipt of the December 6 email and confirming that VOGA would provide relevant updates if an unplanned event were to occur (SI Report, reference 2.4.2). o VOGA also requested if Pilbara Ports has any further comments or feedback on the proposed activities in this EP. • On 11 December 2024, PPA emailed VOGA, the email was an automatic reply as the representative of PPA was on leave at the time (SI Report, reference 2.4.3).			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
PPA advised that it had reviewed the materials sent and had no comment on the proposed activities.	VOGA notes that PPA has advised that it has no comments on the proposed activities under this EP.	VOGA accepts that PPA has no comment at this time.	VOGA considers the measures and controls in the EP address PPA's functions, interests or activities.

PPA requested that it be notified as soon as practicable if an unplanned event occurs. While feedback has been received, there were no objections or claims on this EP.	VOGA accepts PPA's request for notification	VOGA confirmed that it will notify PPA of any unplanned events as soon as practicable. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA will notify PPA of any unplanned events.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with PPA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to PPA on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence and consultation material sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to PPA over a one-month period.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- In line with NOPSEMA's guideline for engagement with State government departments or agencies, VOGA used email for its consultation with PPA.

Section 25(1)(d) of the OPGGS(E)R: Persons or organisations whose functions, interests or activities may be affected by the activities to be carried out under the environment plan

Commonwealth commercial fishing - representative bodies

Western Rock Lobster Council (WRLC)

Consultation overview and summary of response on this EP

- On 13 November 2024, VOGA emailed WRLC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.16).
    - VOGA sought WRLC's input on the preferred method of consultation with commercial fisheries and aims to ensure the engagement is tailored to meet their needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 2 December 2024, VOGA emailed WRLC advising of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information Sheet (Record of Consultation, references 3.5, 1.1 and 1.2).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; the location and timing of activities; an outline of the activities to be conducted; a list of relevant state and Commonwealth-managed fisheries and an overview of consultation plans within the Operational Area and the EMBA.
    - VOGA also acknowledged WAFIC's consultation guidance and advised it had consulted with fishing industry associations directly and has applied this by consulting with relevant fishing industry associations for commercial fisheries identified as having potential for interaction in the operational area and EMBA.
- On 13 January 2025, VOGA emailed WRLC following up on the proposed activity and provided information for the commercial fishing sector, a Consultation Information Sheet and Commercial Fishing Information Sheet (Record of Consultation, reference 4.2, 1.1 and 1.2).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
    - The email also provided information for the Commercial Fishing Sector as supplied on 2 December 2024.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that WRLC has no comment at this time.	VOGA considers the measures and controls in the EP address WRLC's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with WRLC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Initial outreach and consultation information provided to WRLC on 13 November 2024, to inform of upcoming activities based on WRLC's function, interests and activities.
- Consultation information provided to WRLC on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- Commercial Fisher Information Sheet has been provided to stakeholder and publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

- VOGA sent follow-up consultation emails on 13 January 2025, reminding WRLC of the opportunity to provide feedback.

State commercial fishing - representative bodies

Western Australian Fishing Industry Council (WAFIC)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA emailed WAFIC advising of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information Sheet (Record of Consultation, references 3.3, 1.1 and 1.2).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; the location and timing of activities; an outline of the activities to be conducted; a list of relevant state and Commonwealth-managed fisheries and an overview of consultation plans within the Operational Area and the EMBA.
    - VOGA acknowledged WAFIC's consultation guidance and advised it had consulted with fishing industry associations directly and has applied this by consulting with relevant fishing industry associations for commercial fisheries identified as having potential for interaction in the operational area and EMBA.
- Between 2 December 2024 and 17 January 2025, WAFIC and VOGA exchanged correspondence regarding a fee-for-service arrangement for consultation with state commercial fisheries. This is summarised below at "**Record of fee for service arrangement"** section.
- On 17 January 2025, WAFIC emailed VOGA requesting further information about the proposed activities (SI Report, reference 5.1.11).
    - The email outlined a series of concerns, including:
        - How VOGA will monitor the drill cuttings, and what controls are in place to minimise the impacts to demonstrate ALARP.
        - Concerns surrounding the impact of decreased water quality on commercial species.
        - If VOGA had considered the cumulative impacts of decreased water quality from the proposed activities more broadly on the marine environment.
    - WAFIC also acknowledged that more research is required to determine whether it is deemed safe for fishers to fish in the vicinity of drill cuttings and requested that if no safety risk can be guaranteed, is there still a risk of contamination of the catch.
    - WAFIC also requested that in the event of an unplanned spill, VOGA is to contact WAFIC in keeping with the Oil spill response planning documents and to make contact within 24 hours of the spill and for VOGA to retain a current list of WA commercial fisheries that could be impacted by potential scenarios.
    - Confirmation that VOGA will have a suitable Operational and Scientific Monitoring Program (OSMP) to determine impacts and recovery of the

marine environment, and for VOGA to view WAFIC's consultation position for unplanned events.
    - The email confirmed that WAFIC has no further comments on the proposed activities.
- On 14 February 2025, VOGA emailed WAFIC (SI Report, reference 5.1.13).
    - VOGA advised it will provide ongoing communication with mariners on the proposed activities and confirmed that:
        - VOGA would provide ongoing communication with mariners on the proposed activities.
        - VOGA would notify WAFIC of any vessel operation lookahead associated with this EP.
    - VOGA also addressed WAFIC's contamination concerns surrounding drill cuttings and confirmed that:
        - In Upper Well Sections, water-based cuttings accumulate in an 80 x 80 area.
        - In Lower Well Sections, larger sediment particles settle rapidly when discharged at the sea surface.
        - In High-Energy Environments, such as areas with strong tidal currents, drill cuttings and mud do not accumulate on the seabed.
        - Various control mitigation has been implemented for the management of drill cuttings including:
            - Only water-based drilling fluids will be used during exploration drilling, with polymers that break down naturally in the environment.
            - Only drilling and completion fluids that comply with the VOGA's chemical selection process will be used.
            - A drilling unit solids control system will be used to remove fines from drilling fluids to minimise the volume of fluids being discharged.
        - Drilling Fluids and Environmental Compliance have been undertaken, and short drilling durations limit discharges and meet the environmental acceptability of the proposed operations.
        - Post-drilling monitoring is not feasible due to dynamic sediment redistribution.
        - No change in water quality is expected that may impact the habitat quality for fishers.
        - Nektonic and Planktonic species could be affected, however, they will have little to no adverse long-term biological impact in the water column or the seafloor.
        - Drilling fluid will disperse rapidly at the drill location, with minimal risk of bioaccumulation or toxicity effects on marine organisms.
        - And within this EP, VOGA considers the cumulative impacts of decreased water quality from the proposed activities.
    - VOGA also confirmed that in the event of an unplanned spill:
        - Per the Exploration and Survey Oil Pollution Emergency Plan, VOGA would notify WAFIC within 24 hours of a Level 2 oil spill.
        - VOGA would routinely update its EP to ensure all existing information is up to date, which includes a list of state commercial fisheries that may be impacted.
        - VOGA advised that it has prepared and adopted an Oil Spill Monitoring Plan utilising joint industry framework. VOGA is a member of the Oil Spill Response Limited industry arrangement for management.
    - VOGA thanked WAFIC for their position regarding consultation with the relevant fishing industry and that VOGA would utilise the following:
        - Baseline scientific data on aquatic organisms and the marine environment within the OSMP.
        - Understanding the *Fish Resources Management Act 1994* and its procedures is part of VOGA's industry and government liaison process.
        - Scientific monitoring for potential fish tainting.
        - Scientific and operational monitoring in the event of an oil spill as the basis of VOGA's OSMP.

- And that if this should occur, VOGA would consider the matter of compensation.

Record of fee for service arrangement:

- On 29 November 2024, VOGA called WAFIC to request information regarding a fee-for-service engagement for consultation with state commercial fisheries (SI Report, reference 5.1.1).
  - During the call, WAFIC provided the appropriate contact to arrange the agreement and to share consultation information.
- On 2 December 2024, VOGA emailed WAFIC to request a fee-for-service engagement following a review of WAFIC's consultation framework for Commercial Fisheries in Western Australia (Record of Consultation, reference 3.4).
  - The email included attachments of a Consultation Information Sheet and a Commercial Fisher-specific Information Sheet providing relevant details for commercial fisheries (Record of Consultation, reference 1.1 and 1.2).
  - VOGA provided a list of relevant state-managed fisheries based on government fishing effort data. VOGA also provided a list of potential impacts and information about exclusionary zones and communication.
- On 3 December 2024, WAFIC emailed and thanked VOGA for the information provided, and advised what information was required from VOGA for the consultation with state fisheries via the fee for service (SI Report, reference 5.1.2). WAFIC advised that:
  - VOGA should prepare an accompanying email to distribute to licence holders that summarises the planned activity.
  - Licence holders are provided 30 days to respond and that licence holders would provide feedback directly to WAFIC. WAFIC stated that at the end of the feedback period, WAFIC would collate the feedback and provide it to VOGA.
  - WAFIC requested information regarding what fisheries VOGA wished to consult with.
- On 3 December 2024, VOGA emailed WAFIC regarding the fee-for-service engagement (SI Report, reference 5.1.3).
  - The email included a draft email to fisheries and a list of state-managed fisheries identified by VOGA as relevant for consultation (SI Report, reference 5.1.3.1).
  - The email requested that WAFIC provide the licence holders with the attached documents from the 2 December 2024 email.
- On 4 December 2024, WAFIC emailed VOGA regarding the fee-for-service engagement and consultation material (SI Report, reference 5.1.4).
  - WAFIC confirmed the distribution of attachments during the licence holder outreach.
  - WAFIC recommended that the number of fisheries should be reduced and an operational area map should be included.
    - The recommendation by WAFIC outlined the process for identifying the relevant fisheries and provided WAFIC's preferred approach to undertaking consultation.
  - WAFIC outlined its preference for licence holders to provide feedback directly to WAFIC and that any feedback will be provided to VOGA at the end of the consultation process. The email included an updated list of recommended fisheries for consultation and changes to the draft email for fisheries (SI Report, reference 5.1.4.1).
- On 5 December 2024, VOGA emailed WAFIC regarding the fee-for-service engagement, relevant fisheries for consultation and consultation information (SI Report, reference 5.1.5).
  - The email confirmed the receipt of advice and suggestions and agreed to proceed with the recommendations on the draft email and updated list of relevant fisheries recommended by WAFIC.

- The email included two additional maps for inclusion in the email and confirmed the adoption of separate strategies for unplanned events. (SI Report, reference 5.1.5.1).

- On 6 December 2024, WAFIC emailed VOGA regarding the fee-for-service engagement and consultation (SI Report, reference 5.1.6).
  - The email provided an update on relevant fisheries and outlined a final recommended list of fisheries to be consulted.
- On 6 December 2024, WAFIC emailed VOGA to provide an additional relevant fishery, which was missed in the previous email (SI Report, reference 5.1.7).
- On 9 December 2024, VOGA emailed WAFIC regarding the fee-for-service engagement and consultation (SI Report, reference 5.1.8).
  - VOGA confirmed and agreed to the recommended fisheries from WAFIC.
- On 9 December 2024, WAFIC emailed VOGA regarding the fee-for-service engagement and consultation (SI Report, reference 5.1.9).
  - The email confirmed the approved emails and attachments were distributed to the agreed fisheries.
  - The email also stated that WAFIC would provide feedback from licence holders on the EP after 17 January 2025.
  - The email also included an attached invoice for the consultation process (SI Report, reference 5.1.9.1).
- On 9 December 2024, VOGA emailed WAFIC regarding the fee-for-service engagement and consultation, thanking WAFIC for their assistance (SI Report, reference 5.1.10).
- On 21 January 2025, WAFIC emailed VOGA to follow up on the outstanding invoice. The invoice was reattached to the email. (SI Report, reference 5.1.12 and 5.1.12.1).

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
WAFIC requested to be included in any vessel operation notification associated with this EP.	VOGA accepts WAFIC's request for inclusion in vessel operation notification.	VOGA will notify WAFIC of any vessel operations associated with this EP and advise WAFIC on the timing of subsequent EPs.	VOGA will notify WAFIC of any vessel operations associated with this EP (Section 7, Table 7-2, CM-1.2).
In the event of a Level 2 oil spill, WAFIC requested to be notified of any unplanned event within 24 hours.	VOGA accepts WAFIC's request for notification in the event of an unplanned event or spill.	VOGA will notify WAFIC within 24 hours in the event of a Level 2 oil spill.	VOGA will notify WAFIC within 24 hours in the event of a Level 2 oil spill.
WAFIC requested ongoing communication with mariners regarding notices on activity commencement and distances regarding temporary exclusion zones.	VOGA accepts WAFIC's request regarding ongoing communication with mariners.	VOGA initiated a fee-for-service model with WAFIC to communicate with mariners on activity commencement and distances regarding exclusion zones.	VOGA has initiated the engagement to enable ongoing communication with mariners.

WAFIC requested VOGA retain a list of WA commercial fisheries that potential unplanned events may affect.	VOGA accepts WAFIC's request to retain a list of relevant fisheries in the event of potential unplanned events.	WAFIC has provided VOGA with a list of WA commercial fisheries and will communicate on behalf of VOGA as part of the fee-for-service model.	No action required.
WAFIC requested that VOGA have suitable OSMP to determine impacts and recovery of marine environments.	VOGA accepts WAFIC's request for suitable OSMP's.	VOGA has initiated appropriate controls in an Oil Spill Management Plan and has initiated procedures as part of the Fish Resources Management Act 1994 as part of VOGA's industry and government liaison process, including scientific monitoring for potential fish tainting and in the event of an oil spill as the basis of VOGA's OSMP.	VOGA has enacted the appropriate controls as outlined.
WAFIC requested VOGA review WAFIC's position regarding consultation and unplanned events. While feedback has been received, there were no objections or claims on this EP.	VOGA accepts WAFIC's position regarding consultation and unplanned events.	VOGA confirmed it had reviewed WAFIC's position regarding ongoing consultation and unplanned events. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with WAFIC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to WAFIC on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence and consultation material sent. • Commercial Fisher Information Sheet has been provided to stakeholder and publicly available on the VOGA website since December 2024. • Consultation for this EP commenced in December 2024. • VOGA has addressed and responded to WAFIC over a two-month period. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

State commercial fisheries			
Mackerel Managed Fishery - Area 2			
Consultation overview and summary of response on this EP			
• In accordance with VOGA's "Fee for Service Agreement" with WAFIC and WAFIC's 'Commercial Fishing Consultation Framework for the Offshore Oil and Gas Sector' WAFIC engaged the licence holders of Mackerel Managed Fishery - Area 2 on behalf of VOGA as their fishing area intersects the operational area and there is expected fishing effort (Record of Consultation, references 3.3 – 3.4). • On 2 December 2024, VOGA provided WAFIC with consultation information to distribute to licence holders of Mackerel Managed Fishery - Area 2 (Record of Consultation, reference 3.3). • On 9 December 2024, WAFIC contacted licence holders of Mackerel Managed Fishery – Area 2 to advise of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information sheet (SI Report, reference 5.1.9 and Record of Consultation, reference 1.1 and 1.2). o The email included an activity summary, directions for providing input into the EP development through consultation, the closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. o The Commercial Fisher information sheet included an overview of the proposed activities, key information about the commercial fishing sector, coordinates for operational areas, an activity summary, an assessment of commercial fishing, potential effects and impacts, and VOGA's impact assessment. • On 17 January 2025, WAFIC emailed VOGA advising that it did not receive any feedback from licence holders on this EP, including from Mackerel Managed Fishery – Area 2 (SI Report, reference 5.1.11).			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA accepts that the individual relevant licence holders of the Mackerel Managed Fishery – Area 2 have no comment at this time.	VOGA has consulted DPIRD, WAFIC and individual relevant licence holders via WAFIC. VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and	VOGA has assessed the relevancy of State fisheries in Section 3.5.1 of this EP. VOGA will notify DPIRD and WAFIC prior to the commencement and at the end of the activity.

		Revision process, where appropriate (Section 8.11 of the EP).	No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Mackerel Managed Fishery - Area 2 for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient information

- Consultation information was provided to the Mackerel Managed Fishery - Area 2 through WAFIC on 9 December 2024, based on their function, interest, and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence and consultation material sent.
- Commercial Fisher Information Sheet, developed specifically for fisheries, was provided to the Mackerel Managed Fishery - Area 2 on 9 December 2024.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Onslow Prawn Limited Entry Fishery

Consultation overview and summary of response on this EP

- In accordance with VOGA's "Fee for Service Agreement" with WAFIC and WAFIC's 'Commercial Fishing Consultation Framework for the Offshore Oil and Gas Sector' WAFIC engaged the licence holders of Onslow Prawn Limited Entry Fishery on behalf of VOGA as their fishing area intersects the operational area and there is expected fishing effort (Record of Consultation, references 3.3 and 3.4).
- On 2 December 2024, VOGA provided WAFIC with consultation information to distribute to licence holders of Onslow Prawn Limited Entry Fishery

(Record of Consultation, reference 3.3).

- On 9 December 2024, WAFIC contacted licence holders of Onslow Prawn Limited Entry Fishery to advise of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information sheet (SI Report, reference 5.1.9 and Record of Consultation, reference 1.1 and 1.2).
    - The email included an activity summary, directions for providing input into the EP development through consultation, the closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher information sheet included an overview of the proposed activities, key information about the commercial fishing sector, coordinates for operational areas, an activity summary, an assessment of commercial fishing, potential effects and impacts, and VOGA's impact assessment.
- On 17 January 2025, WAFIC emailed VOGA advising that it did not receive any feedback from licence holders on this EP, including from Onslow Prawn Limited Entry Fishery (SI Report, reference 5.1.11).

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA accepts that the individual relevant licence holders of the Onslow Prawn Limited Entry Fishery have no comment at this time.	VOGA has consulted DPIRD, WAFIC and individual relevant licence holders via WAFIC. VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA has assessed the relevancy of State fisheries in Section 3.5.1 of this EP. VOGA will notify DPIRD and WAFIC prior to the commencement and at the end of the activity. No additional measures or controls are required.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Onslow Prawn Limited Entry Fishery for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information was provided to the Onslow Prawn Limited Entry Fishery through WAFIC on 9 December 2024, based on their function, interest, and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence and consultation material sent. • Commercial Fisher Information Sheet, developed specifically for fisheries, was provided to the Onslow Prawn Limited Entry Fishery on 9 December 2024. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Pilbara Crab Managed Fishery			
Consultation overview and summary of response on this EP			
• In accordance with VOGA's "Fee for Service Agreement" with WAFIC and WAFIC's 'Commercial Fishing Consultation Framework for the Offshore Oil and Gas Sector' WAFIC engaged the licence holders of Pilbara Crab Managed Fishery on behalf of VOGA as their fishing area intersects the operational area and there is expected fishing effort (Record of Consultation, references 3.3 and 3.4). • On 2 December 2024, VOGA provided WAFIC with consultation information to distribute to licence holders of Pilbara Crab Managed Fishery (Record of Consultation, reference 3.3). • On 9 December 2024, WAFIC contacted licence holders of Pilbara Crab Managed Fishery to advise of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information sheet (SI Report, reference 5.1.9 and Record of Consultation, reference 1.1 and 1.2). o The email included an activity summary, directions for providing input into the EP development through consultation, the closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. o The Commercial Fisher information sheet included an overview of the proposed activities, key information about the commercial fishing sector, coordinates for operational areas, an activity summary, an assessment of commercial fishing, potential effects and impacts, and VOGA's impact assessment. • On 17 January 2025, WAFIC emailed VOGA advising that it did not receive any feedback from licence holders on this EP, including from Pilbara Crab Managed Fishery (SI Report, reference 5.1.11).			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA accepts that the individual relevant licence holders of the Pilbara Crab Managed Fishery have no comment at this time.	VOGA has consulted DPIRD, WAFIC and individual relevant licence holders via WAFIC. VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where	VOGA has assessed the relevancy of State fisheries in Section 3.5.1 of this EP. VOGA will notify DPIRD and WAFIC prior to the commencement and at the end of the activity. No additional measures or controls are required.

		appropriate (Section 8.11 of the EP).	

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Pilbara Crab Managed Fishery for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information was provided to the Pilbara Crab Managed Fishery through WAFIC on 9 December 2024, based on their function, interest, and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence and consultation material sent.
- Commercial Fisher Information Sheet, developed specifically for fisheries, was provided to the Pilbara Crab Managed Fishery on 9 December 2024.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Pilbara Line Fishery (Condition)

Consultation overview and summary of response on this EP

- In accordance with VOGA's "Fee for Service Agreement" with WAFIC and WAFIC's 'Commercial Fishing Consultation Framework for the Offshore Oil and Gas Sector' WAFIC engaged the licence holders of Pilbara Line Fishery (Condition) on behalf of VOGA as their fishing area intersects the operational area and there is expected fishing effort (Record of Consultation, references 3.3 and 3.4).
- On 2 December 2024, VOGA provided WAFIC with consultation information to distribute to licence holders Pilbara Line Fishery (Condition) (Record of Consultation, reference 3.3).
- On 9 December 2024, WAFIC contacted licence holders of Pilbara Line Fishery (Condition) to advise of the proposed activity and provided a

Consultation Information Sheet and Commercial Fisher Information sheet (SI Report, reference 5.1.9 and Record of Consultation, reference 1.1 and 1.2).

- The email included an activity summary, directions for providing input into the EP development through consultation, the closing date and a link to VOGA's website with additional resources on EP consultation.
- The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- The Commercial Fisher information sheet included an overview of the proposed activities, key information about the commercial fishing sector, coordinates for operational areas, an activity summary, an assessment of commercial fishing, potential effects and impacts, and VOGA's impact assessment.

- On 17 January 2025, WAFIC emailed VOGA advising that it did not receive any feedback from licence holders on this EP, including from Pilbara Line Fishery (Condition) (SI Report, reference 5.1.11).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA accepts that the individual relevant licence holders of the Pilbara Line Fishery (Condition) have no comment at this time.	VOGA has consulted DPIRD, WAFIC and individual relevant licence holders via WAFIC. VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA has assessed the relevancy of State fisheries in Section 3.5.1 of this EP. VOGA will notify DPIRD and WAFIC prior to the commencement and at the end of the activity. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Pilbara Line Fishery (Condition) for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information was provided to the Pilbara Line Fishery (Condition) through WAFIC on 9 December 2024, based on their function, interest, and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence and consultation material sent.
- Commercial Fisher Information Sheet, developed specifically for fisheries, was provided to the Pilbara Line Fishery (Condition) on 9 December 2024.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Pilbara Fish Trawl Interim Managed Fishery

Consultation overview and summary of response on this EP

- In accordance with VOGA's "Fee for Service Agreement" with WAFIC and WAFIC's 'Commercial Fishing Consultation Framework for the Offshore Oil and Gas Sector' WAFIC engaged the licence holders of Pilbara Fish Trawl Interim Managed Fishery on behalf of VOGA as their fishing area intersects the operational area and there is expected fishing effort (Record of Consultation, references 3.3 and 3.4).
- On 2 December 2024, VOGA provided WAFIC with consultation information to distribute to licence holders Pilbara Fish Trawl Interim Managed Fishery (Record of Consultation, reference 3.3).
- On 9 December 2024, WAFIC contacted licence holders of Pilbara Fish Trawl Interim Managed Fishery to advise of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information sheet (SI Report, reference 5.1.9 and Record of Consultation, reference 1.1 and 1.2).
    - The email included an activity summary, directions for providing input into the EP development through consultation, the closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher information sheet included an overview of the proposed activities, key information about the commercial fishing sector, coordinates for operational areas, an activity summary, an assessment of commercial fishing, potential effects and impacts, and VOGA's impact assessment.

- On 17 January 2025, WAFIC emailed VOGA advising that it did not receive any feedback from licence holders on this EP, including from Pilbara Fish Trawl Interim Managed Fishery (SI Report, reference 5.1.11).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA accepts that the individual relevant licence holders of the Pilbara Fish Trawl Interim Managed Fishery have no comment at this time.	VOGA has consulted DPIRD, WAFIC and individual relevant licence holders via WAFIC. VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA has assessed the relevancy of State fisheries in Section 3.5.1 of this EP. VOGA will notify DPIRD and WAFIC prior to the commencement and at the end of the activity. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Pilbara Fish Trawl Interim Managed Fishery for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information was provided to the Pilbara Fish Trawl Interim Managed Fishery through WAFIC on 9 December 2024, based on their function, interest, and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence and consultation material sent.
- Commercial Fisher Information Sheet, developed specifically for fisheries, was provided to the Pilbara Fish Trawl Interim Managed Fishery on 9 December 2024.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Pilbara Trap Managed Fishery

Consultation overview and summary of response on this EP

- In accordance with VOGA's "Fee for Service Agreement" with WAFIC and WAFIC's 'Commercial Fishing Consultation Framework for the Offshore Oil and Gas Sector' WAFIC engaged the licence holders of Pilbara Trap Managed Fishery on behalf of VOGA as their fishing area intersects the operational area and there is expected fishing effort (Record of Consultation, references 3.3 and 3.4).
- On 2 December 2024, VOGA provided WAFIC with consultation information to distribute to licence holders Pilbara Trap Managed Fishery (Record of Consultation, reference 3.3).
- On 9 December 2024, WAFIC contacted licence holders of Pilbara Trap Managed Fishery to advise of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information sheet (SI Report, reference 5.1.9 and Record of Consultation, reference 1.1 and 1.2).
    - The email included an activity summary, directions for providing input into the EP development through consultation, the closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher information sheet included an overview of the proposed activities, key information about the commercial fishing sector, coordinates for operational areas, an activity summary, an assessment of commercial fishing, potential effects and impacts, and VOGA's impact assessment.
- On 17 January 2025, WAFIC emailed VOGA advising that it did not receive any feedback from licence holders on this EP, including from Pilbara Trap Managed Fishery (SI Report, reference 5.1.11).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA accepts that the individual relevant licence holders of the Pilbara Trap Managed Fishery have no comment at this time.	VOGA has consulted DPIRD, WAFIC and individual relevant licence holders via WAFIC. VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA has assessed the relevancy of State fisheries in Section 3.5.1 of this EP. VOGA will notify DPIRD and WAFIC prior to the commencement and at the end of the activity. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Pilbara Trap Managed Fishery for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information was provided to the Pilbara Trap Managed Fishery through WAFIC on 9 December 2024, based on their function, interest, and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence and consultation material sent.
- Commercial Fisher Information Sheet, developed specifically for fisheries, was provided to the Pilbara Trap Managed Fishery on 9 December 2024.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.

- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

West Coast Rock Lobster Managed Fishery

Consultation overview and summary of response on this EP

- On 18 December 2024, VOGA emailed West Coast Rock Lobster Managed Fishery advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.35, 1.1 and 1.2)
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation and a Commercial Fishery Information Sheet.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher information sheet included an overview of the proposed activities; key information for the commercial fishing sector about the activities; coordinates for operational areas; an activity summary; assessment of commercial fishing, potential effects and impacts; and VOGA's impact assessment.
- On 13 January 2025, VOGA emailed West Coast Rock Lobster Managed Fishery following up on the proposed activity, provided information for the commercial fishing sector and provided a Consultation Information Sheet and Commercial Fishing Information Sheet (Record of Consultation, reference 4.17, 1.1 and 1.2.)
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
    - The email also provided information for the Commercial Fishing Sector as supplied on 18 December 2024.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA accepts that the individual relevant licence holders of the West Coast Rock Lobster Managed Fishery have no comment at this time.	VOGA has consulted DPIRD, WAFIC and individual relevant licence holders via WAFIC. VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA has assessed the relevancy of State fisheries in Section 3.5.1 of this EP. VOGA will notify DPIRD and WAFIC prior to the commencement and at the end of the activity. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with West Coast Rock Lobster Managed Fishery for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information was provided to the West Coast Rock Lobster Managed Fishery through WAFIC on 9 December 2024, based on their function, interest, and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was notified in the initial consultation correspondence and consultation material sent.
- Commercial Fisher Information Sheet, developed specifically for fisheries, was provided to the West Coast Rock Lobster Managed Fishery on 9 December 2024.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 to 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.

- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Recreational fishers and marine users and peak representative bodies

WA Game Fishing Association (WAGFA)

Consultation overview and summary of response on this EP

- On 14 November 2024, VOGA emailed WAGFA to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.20).
  - VOGA sought WAGFA's input on the preferred method of consultation with recreational fishers and aims to ensure the engagement is tailored to meet their needs.
  - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 2 December 2024, VOGA emailed WAGFA advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.6 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed WAGFA following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.10 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that WAGFA has no comment at this time.	VOGA considers the measures and controls in the EP address WAGFA's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with WAGFA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Initial outreach and consultation information provided to WAGFA on 14 November 2024, to inform of upcoming activities based on WAGFA's function, interests and activities.
- Consultation information provided to WAGFA on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding WAGFA of the opportunity to provide feedback.

Recfishwest

Consultation overview and summary of response on this EP

- On 13 November 2024, VOGA emailed Recfishwest to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.17).
    - VOGA sought Recfishwest's input on the preferred method of consultation with recreational fishers and aims to ensure the engagement is tailored to meet their needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 19 November 2024, Recfishwest emailed VOGA, providing information regarding the organisation's scope and mission, including the development of artificial reefs. The email also expressed interest in arranging a meeting for Recfishwest to present to VOGA (SI Report, reference 7.1.1).

- On 2 December 2024, VOGA emailed Recfishwest advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.6 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 11 December 2024, VOGA emailed Recfishwest accepting the offer of a meeting and proposed either the 13 or 14 January 2025 for a potential meeting (SI Report, reference 7.1.2).
- On 20 December 2024, Recfishwest emailed VOGA confirming its availability to meet with VOGA on 14 January 2025 (SI Report, reference 7.1.3).
- On 9 January 2025, VOGA emailed Recfishwest confirming the meeting and sent a meeting invitation (SI Report, reference 7.1.4 and 7.1.4.1).
- On 13 January 2025, VOGA called Recfishwest to follow up on the meeting request (SI Report, reference 7.1.5).
    - During the call, Recfishwest confirmed their in-person and remote attendance at VOGA's office. The scope of the meeting was agreed upon, and Recfishwest advised its request to present information and discuss ongoing engagement.
- On 13 January 2025, Recfishwest emailed VOGA confirming their attendance (SI Report, reference 7.1.6).
- On 14 January 2025, VOGA met with Recfishwest for an initial consultation meeting (SI Report, reference 7.1.7).
    - The meeting involved a mutually agreed agenda of presentations from both VOGA and Recfishwest.
    - VOGA to provide background on Wandoo, operations, and activities going forward with the project.
    - Recfishwest provided background on the organisation, key information regarding recreational fishing, and an overview of its work with artificial reef structures.
    - VOGA's presentation provided an overview of the proposed activities under this EP, including highlighting key information that there is an exclusion safety zone for the proposed activities and shared potential impacts to fisheries and proposed control measures. VOGA welcomed any feedback from Recfishwest (SI Report, reference 7.1.7.1).
        - Recfishwest asked if there were to be any pre-work surveys before drilling commencement to determine if there were any sensitive habitats before drilling was undertaken.
        - Recfishwest also asked if this is something NOPSEMA checks within the EP review, to which VOGA confirmed.
        - Recfishwest asked a number of questions about VOGA's activities that are not relevant to the activities proposed under this EP. These concerned life of the facility, decommissioning and information sharing about consultation. VOGA provided further information regarding production life, decommissioning, and its rigs to the reef program.
    - Recfishwest's presentation provided background on the organisation, shared information regarding the recreational fishing sector, and outlined information concerning recreational fishing in the Pilbara and community values.
        - Recfishwest provided an overview of its services and the group's ability to install artificial reef structures.
            - It shared information about alternative operations for decommissioning, timelines for work on artificial reefs, and information on sea dumping permits and the organisation's policy work.
            - Recfishwest evidenced current and proposed locations of artificial reefs.

- Recfishwest shared information on industry partnerships.
  - The meeting concluded with VOGA committing to provide ongoing consultation with Recfishwest through the life of the EP.
  - Recfishwest offered to provide input to the recreational fishing section of this EP, and VOGA agreed to provide the section for review and input.
  - Recfishwest expressed a desire for continued information sharing with VOGA to inform its research, and VOGA agreed to share information on its rigs to reef program and monitoring programs undertaken.
- On 15 January 2025, Recfishwest emailed VOGA providing feedback that information regarding recreational fishing activities was missing from VOGA's consultation materials, and that some information was outdated on recreational fishing within the existing Wandoo Facility EP (SI Report, reference 7.1.8).
  - Recfishwest offered to review information on recreational fishing within VOGA's EPs to ensure its up-to-date and accurate.
  - Recfishwest requested to be kept informed regarding progress so relevant information may be communicated to the recreational fishing community.
- On 12 February 2025, VOGA emailed Recfishwest to thank them for their support and offer to review information on recreational fishing within this EP (SI Report, reference 7.1.9).
  - VOGA provided an updated draft excerpt of the EP with information on recreational fishing and welcomed feedback and input from Recfishwest. VOGA advised it would consider the advice and input for recreational fishing.
  - VOGA offered to provide Recfishwest with notifications for activity updates, start timing, and exclusion zones and thanked Recfishwest for their offer to communicate with recreational fishers as appropriate.
- On 30 April 2025, Recfishwest emailed VOGA apologising for the delay in correspondence, and informed VOGA of a recent trip undertaken by Recfishwest to learn more regarding the rigs-to-reefs program. Recfishwest also advised that they would like to share this information with VOGA. Recfishwest also responded to the proposed text provided to VOGA (SI Report, reference 7.1.10).
  - Regarding the proposed text, Recfishwest provided additional text to include, and information that as more data is received on recreational fishing, that Recfishwest would provide VOGA with updates for future EP revisions.
- On 6 May 2025, VOGA emailed Recfishwest to confirm that VOGA would welcome a presentation or any lessons learnt during the conference to assist with decommissioning planning. VOGA also thanked Recfishwest for the updated text, and confirmed that the text would be included as part of this EP (SI Report, reference 7.1.11).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
Recfishwest provided feedback regarding VOGA's coverage of recreational fishing in another EP and offered to provide input to update the information.	VOGA accepts Recfishwest's feedback regarding coverage of recreational fishing in this EP.	VOGA provided updated draft for this EP for Recfishwest to review and provide input. VOGA advised it will consider Recfishwest's advice on recreational fishing and incorporate it into its EP as appropriate.	No additional EP controls required.
Recfishwest provided feedback regarding VOGA's draft text on recreational fishing in this EP.	VOGA noted Recfishwest's feedback regarding the draft recreational fishing information.	VOGA accepts Recfishwest's feedback and has considered Recfishwest's advice regarding recreational fishing.	VOGA has incorporated Recfishwest's feedback into this EP.
Recfishwest requested to be notified about the progress of the EP and project to keep the recreational fishing community informed. While feedback has been received, there were no objections or claims on this EP.	VOGA accepts Recfishwest's request to be notified.	VOGA offered to provide activity updates to Recfishwest on start timing and inclusion zones. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA has offered to provide notifications to Recfishwest on progress during this EP's activities. VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Recfishwest for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Initial outreach and consultation information provided to Recfishwest on 13 November 2024, to inform of upcoming activities based on Recfishwest's function, interests and activities. • Consultation information provided to Recfishwest on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • VOGA has addressed and responded to Recfishwest over a seven-month period. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Marine Tourism WA			
Consultation overview and summary of response on this EP			
• On 14 November 2024, VOGA emailed Marine Tourism WA to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.18). o VOGA sought Marine Tourism WA's input on the preferred method of consultation with recreational fishers and aims to ensure the engagement is tailored to meet their needs. o VOGA also provided information on confidentiality and the option to opt out of the consultation. • On 2 December 2024, VOGA emailed Marine Tourism WA advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.6 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Marine Tourism WA following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.10 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Marine Tourism WA has no comment at this time.	VOGA considers the measures and controls in the EP address Marine Tourism WA's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Marine Tourism WA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Initial outreach and consultation information provided to Marine Tourism WA on 14 November 2024, to inform of upcoming activities based on Marine Tourism WA's function, interests and activities. • Consultation information provided to Marine Tourism WA on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Marine Tourism WA of the opportunity to provide feedback.

Ashburton Anglers

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA emailed Ashburton Anglers advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.6 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Ashburton Anglers following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.10 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Ashburton Anglers has no comment at this time.	VOGA considers the measures and controls in the EP address Ashburton Anglers' functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Ashburton Anglers for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Ashburton Anglers on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Ashburton Anglers of the opportunity to provide feedback.

Exmouth Game Fishing Club (EGFC)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA emailed EGFC advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.6 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed EGFC following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.10 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that EGFC has no comment at this time.	VOGA considers the measures and controls in the EP address EGFC's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with EGFC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to EGFC on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding EGFC of the opportunity to provide feedback.

King Bay Game Fishing Club (KBFC)			
Consultation overview and summary of response on this EP			

• On 2 December 2024, VOGA emailed KBFC advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.6 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
• On 13 January 2025, VOGA emailed KBFC following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.10 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that KBFC has no comment at this time.	VOGA considers the measures and controls in the EP address KBFC's functions, interests or activities.
Consultation demonstration statement			
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with KBFC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to KBFC on 2 December 2024 based on their function, interest and activities.			

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding KBFC of the opportunity to provide feedback.

Nickol Bay Sportsfishing Club (NBSC)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA emailed NBSC advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.6 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed NBSC following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.10 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that NBSC has no comment at this time.	VOGA considers the measures and controls in the EP address NBSC's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with NBSC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to NBSC on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding NBSC of the opportunity to provide feedback.

Pilbara / Kimberley Recreational Marine Users

Consultation overview and summary of response on this EP

- On 9 December 2024, VOGA sent a letter to Pilbara & Kimberley Recreational Marine Users advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.37 and 1.1).
  - The letter included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA sent a follow-up letter to Pilbara & Kimberley Recreational Marine Users on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.20 and 1.1).
  - The email included an activity summary, directions for how to provide input to into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Pilbara & Kimberley Recreational Marine Users has no comment at this time.	VOGA considers the measures and controls in the EP address Pilbara & Kimberley Recreational Marine Users' functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Pilbara & Kimberley Recreational Marine Users for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Pilbara & Kimberley Recreational Marine Users on 9 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.

- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation letters on 13 January 2025, reminding Pilbara & Kimberley Recreational Marine Users of the opportunity to provide feedback.

Gascoyne Recreational Marine Users

Consultation overview and summary of response on this EP

- On 9 December 2024, VOGA sent a letter to Gascoyne Recreational Marine Users advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.37 and 1.1).
    - The letter included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA sent a follow-up letter to Gascoyne Recreational Marine Users on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.20 and 1.1).
    - The email included an activity summary, directions for how to provide input to into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Gascoyne Recreational Marine Users has no comment at this time.	VOGA considers the measures and controls in the EP address Gascoyne Recreational Marine Users' functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Gascoyne Recreational Marine Users for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Gascoyne Recreational Marine Users on 9 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Gascoyne Recreational Marine Users of the opportunity to provide feedback.

West Coast Recreational Marine Users

Consultation overview and summary of response on this EP

- On 9 December 2024, VOGA sent a letter to West Coast Recreational Marine Users advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.39 and 1.1).
  - The letter included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA sent a follow-up letter to West Coast Recreational Marine Users on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.22 and 1.1).
  - The email included an activity summary, directions for how to provide input to into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

VOGA's assessment of the merits	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that West Coast Recreational Marine Users have no comment at this time.	VOGA considers the measures and controls in the EP address West Coast Recreational Marine Users' functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with West Coast Recreational Marine Users for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to West Coast Recreational Marine Users on 9 December 2024 based on their function, interest and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding West Coast Recreational Marine Users of the opportunity to provide feedback.

Energy industry titleholders and operators

3D Energi Limited

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed 3D Energi Limited Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.20 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed 3D Energi Limited following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.18 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that 3D Energi Limited has no comment at this time.	VOGA considers the measures and controls in the EP address 3D Energi Limited's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with 3D Energi Limited for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to 3D Energi Limited on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding 3D Energi Limited of the opportunity to provide feedback.

Beagle No. 1 Pty Ltd / Longreach Capital Investment			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Beagle No. 1 Pty Ltd / Longreach Capital Investment advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Beagle No. 1 Pty Ltd / Longreach Capital Investment following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Beagle No. 1 Pty Ltd / Longreach Capital Investment has no comment at this time.	VOGA considers the measures and controls in the EP address Beagle No. 1 Pty Ltd / Longreach Capital Investment's functions, interests or activities.
Consultation demonstration statement			
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Beagle No. 1 Pty Ltd / Longreach Capital Investment for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Beagle No. 1 Pty Ltd / Longreach Capital Investment on 3 December 2024 based on their function, interest and activities.			

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Beagle No. 1 Pty Ltd / Longreach Capital Investment of the opportunity to provide feedback.

Bengal Energy Ltd

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Bengal Energy Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.20 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Bengal Energy Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.18 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Bengal Energy Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address Bengal Energy Ltd's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation Bengal Energy Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Bengal Energy Ltd on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Bengal Energy Ltd of the opportunity to provide feedback.

BP Developments Australia			
Consultation overview and summary of response on this EP			

• On 3 December 2024, VOGA emailed BP Developments Australia advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
• On 11 December 2024, BP emailed VOGA and reported it had no concerns with the activities associated with the EP (SI Report, reference 8.1.1).
• On 11 December 2024, VOGA emailed BP and thanked it for its response (SI Report, reference 8.1.2).			

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
BP Developments Australia reported it had no concerns with the activities associated with the EP. Whilst feedback has been received, there were no objections or claims.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA notes BP Developments Australia has advised it has no comments on the proposed activities under this EP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
Consultation demonstration statement			
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation BP Developments Australia for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to BP Developments Australia on 3 December 2024 based on their function, interest and activities.			

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Chevron Australia

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Chevron Australia advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Chevron Australia following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Chevron Australia has no comment at this time.	VOGA considers the measures and controls in the EP address Chevron Australia's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Chevron Australia for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Chevron Australia on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Chevron Australia of the opportunity to provide feedback.

Eni Australia B.V.

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Eni Australia B.V. advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.20 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 3 December 2024, Eni Australia B.V. emailed VOGA to advise that they had no concerns regarding the activity, and to request an update if there are any material changes to the planned activities (SI Report, reference 8.2.1)
- On 11 December 2024, VOGA emailed Eni Australia B.V. to thank it for its response, and confirmed that VOGA will provide updates as they become available (SI Report, reference 8.2.2)

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
Eni Australia B.V. reported it had no concerns with the activities associated with the EP. Whilst feedback has been received, there were no objections or claims.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA notes Eni Australia B.V. has advised it has no comments on the proposed activities under this EP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation Eni Australia B.V. for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Eni Australia B.V. on 3 December 2024 based on their function, interest and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

EOG Resources Australia Pty Ltd

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed EOG Resources Australia Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.20 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed EOG Resources Australia Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.18 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that EOG Resources Australia Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address EOG Resources Australia Pty Ltd's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with EOG Resources Australia Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to EOG Resources Australia Pty Ltd on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding EOG Resources Australia Pty Ltd of the opportunity to provide feedback.

Finder No 16 Pty Ltd

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Finder No 16 Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 4 December 2024, Finder No 16 Pty Ltd emailed VOGA and reported no concerns with the activities associated with the EP (SI Report, reference 8.3.1).
- On 11 December 2024, VOGA emailed Finder No 16 Pty Ltd and thanked it for its response (SI Report, reference 8.3.2).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
Finder No 16 Pty Ltd reported it had no concerns with the activities associated with the EP. Whilst feedback has been received, there were no objections or claims.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA notes Finder No 16 Pty Ltd has advised it has no comments on the proposed activities under this EP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation Finder No 16 Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Finder No 16 Pty Ltd on 3 December 2024 based on their function, interest and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

INPEX Browse E&P Pty Ltd

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed INPEX Browse E&P Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed INPEX Browse E&P Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that INPEX Browse E&P Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address INPEX Browse E&P Pty Ltd's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with INPEX Browse E&P Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to INPEX Browse E&P Pty Ltd on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding INPEX Browse E&P Pty Ltd of the opportunity to provide feedback.

IPB WA 424P Pty Ltd			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed IPB WA 424P Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.20 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed IPB WA 424P Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that IPB WA 424P Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address IPB WA 424P Pty Ltd's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with IPB WA 424P Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to IPB WA 424P Pty Ltd on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding IPB WA 424P Pty Ltd of the opportunity to provide feedback.

Jadestone Energy (Australia) Pty Ltd			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Jadestone Energy (Australia) Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Jadestone Energy (Australia) Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Jadestone Energy (Australia) Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address Jadestone Energy (Australia) Pty Ltd's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Jadestone Energy (Australia) Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Jadestone Energy (Australia) Pty Ltd on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Jadestone Energy (Australia) Pty Ltd of the opportunity to provide feedback.

Kato Energy (WA) Pty Ltd			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Kato Energy (WA) Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Kato Energy (WA) Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Kato Energy (WA) Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address Kato Energy (WA) Pty Ltd's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Kato Energy (WA) Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Kato Energy (WA) Pty Ltd on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Kato Energy (WA) Pty Ltd of the opportunity to provide feedback.

Kufpec (Perth) Pty Ltd			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Kufpec (Perth) Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Kufpec (Perth) Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Kufpec (Perth) Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address Kufpec (Perth) Pty Ltd's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation Kufpec (Perth) Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: • Consultation information provided to Kufpec (Perth) Pty Ltd on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Kufpec (Perth) Pty Ltd of the opportunity to provide feedback.
MEO International Pty Ltd
Consultation overview and summary of response on this EP

• On 3 December 2024, VOGA emailed MEO International Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
• On 13 January 2025, VOGA emailed MEO International Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that MEO International Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address MEO International Pty Ltd's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with MEO International Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to MEO International Pty Ltd on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding MEO International Pty Ltd of the opportunity to provide feedback.

Mobil Australia Resources Company Pty Limited			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Mobil Australia Resources Company Pty Limited advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Mobil Australia Resources Company Pty Limited following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Mobil Australia Resources Company Pty Limited has no comment at this time.	VOGA considers the measures and controls in the EP address Mobil Australia Resources Company Pty Limited's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Mobil Australia Resources Company Pty Limited for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Mobil Australia Resources Company Pty Limited on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Mobil Australia Resources Company Pty Limited of the opportunity to provide feedback.

Pathfinder Energy Pty Ltd			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Pathfinder Energy Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.20 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Pathfinder Energy Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Pathfinder Energy Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address Pathfinder Energy Pty Ltd's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Pathfinder Energy Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Pathfinder Energy Pty Ltd on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Pathfinder Energy Pty Ltd of the opportunity to provide feedback.

Pilot Energy Limited			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Pilot Energy Limited advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.20 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Pilot Energy Limited following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Pilot Energy Limited has no comment at this time.	VOGA considers the measures and controls in the EP address Pilot Energy Limited's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Pilot Energy Limited for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Pilot Energy Limited on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Pilot Energy Limited of the opportunity to provide feedback.

Santos Offshore Pty Ltd			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Santos Offshore Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Santos Offshore Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Santos Offshore Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address Santos Offshore Pty Ltd's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Santos Offshore Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Santos Offshore Pty Ltd on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Santos Offshore Pty Ltd of the opportunity to provide feedback.

Shell Australia Pty Ltd			
Consultation overview and summary of response on this EP			

• On 3 December 2024, VOGA emailed Shell Australia Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
• On 13 January 2025, VOGA emailed Shell Australia Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
• On 9 December 2024, VOGA emailed Shell to forward the previous communications following an undelivered email notice, and requested the appropriate email for consultation (SI Report, reference 8.4.1)
• On 31 January 2025, Shell emailed VOGA to confirm the correct contact for ongoing consultation (SI Report, reference 8.4.2).
• On 3 February 2025, VOGA emailed Shell to ask if Shell had any feedback on the proposed activities in this EP (SI Report, reference 8.4.3).			

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
Shell Australia Pty Ltd reported it had no concerns with the activities associated with the EP. Whilst feedback has been received, there were no objections or claims.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA notes Shell Australia Pty Ltd has advised it has no comments on the proposed activities under this EP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation Shell Australia Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Shell Australia Pty Ltd on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Triangle Energy (Operations) Pty Ltd			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Triangle Energy (Operations) Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.20 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Triangle Energy (Operations) Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Triangle Energy (Operations) Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address Triangle Energy (Operations) Pty Ltd's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Triangle Energy (Operations) Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Triangle Energy (Operations) Pty Ltd on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Triangle Energy (Operations) Pty Ltd of the opportunity to provide feedback.

Western Gas (474 P) Pty Ltd			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Western Gas (474 P) Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Western Gas (474 P) Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts Western Gas (474 P) Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address Western Gas (474 P) Pty Ltd's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Western Gas (474 P) Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient information** • Consultation information provided to Western Gas (474 P) Pty Ltd on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Western Gas (474 P) Pty Ltd of the opportunity to provide feedback.

Woodside Energy (Australia) Pty Ltd			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Woodside Energy (Australia) Pty Ltd advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.18 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Woodside Energy (Australia) Pty Ltd following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.11 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Woodside Energy (Australia) Pty Ltd has no comment at this time.	VOGA considers the measures and controls in the EP address Woodside Energy (Australia) Pty Ltd's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Woodside Energy (Australia) Pty Ltd for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Woodside Energy (Australia) Pty Ltd on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Woodside Energy (Australia) Pty Ltd of the opportunity to provide feedback.

Peak industry representative bodies and associations			
Australian Energy Producers (AEP)			
Consultation overview and summary of response on this EP			

• On 2 December 2024, VOGA emailed AEP advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.11 and 1.1).
  ○ The email included an activity summary, an overview of planned consultation with energy industry titleholders, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  ○ VOGA advised AEP that it would consult with energy industry titleholders and operators directly.
• On 13 January 2025, VOGA emailed AEP following up on the proposed activity and a Consultation Information Sheet (Record of Consultation, reference 4.16 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that AEP has no comment at this time.	VOGA considers the measures and controls in the EP address AEP's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with AEP for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to AEP on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding AEP of the opportunity to provide feedback.

Infrastructure operators			
Vocus Communications			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Vocus Communications advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.19 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 18 December 2024, VOGA emailed Vocus Communications, forwarding the initial consultation materials to a new contact following an automatic reply (SI Report, reference 10.1.1). • On 13 January 2025, VOGA sent a follow-up email to Vocus Communications on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.12 and 1.1). o The email included an activity summary, directions for how to provide input to into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP. • On 14 January 2025, Vocus Communications emailed VOGA to confirm the correct contact details and advised Vocus had no comment regarding consultation due to the distance from the Highclere Cable (SI Report, reference 10.1.2). • On 14 January 2025, VOGA emailed Vocus Communications to thank it for the confirmation and review of the materials. VOGA also noted Vocus's advice and comment on proposed activity (SI Report, reference 10.1.3).			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
Vocus Communications reported it had no concerns with the activities associated with the EP. Whilst feedback has been received, there were no objections or claims.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA notes Vocus Communications has advised it has no comments on the proposed activities under this EP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation Vocus Communications for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Vocus Communications on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
Traditional Custodians and First Nations nominated representative corporations
Buurabalayji Thalanyji Aboriginal Corporation RNTBC (BTAC)
Consultation overview and summary of response on this EP

• On 14 October 2024, VOGA called BTAC and left a message following the call being unanswered (SI Report, reference 11.1.1).
• On 14 October 2024, VOGA emailed BTAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.8). VOGA advised that consultation with BTAC regarding these activities is welcome.
  ○ VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
  ○ VOGA requested BTAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
  ○ VOGA proposed a meeting to discuss the planned activities and provide information.
  ○ VOGA emphasised a co-design approach for the consultation process to ensure it meets BTAC's needs.

- VOGA also provided information on confidentiality and the option to opt out of the consultation.

- On 14 October 2024, VOGA emailed BTAC, forwarding the original email sent to an updated contact email (SI Report, reference 11.1.2).
- On 4 December 2024, VOGA emailed BTAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.34 and 1.3).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
  - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
  - VOGA believes BTAC is relevant for consultation and invited them to participate in the process.
  - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
  - VOGA requested formal consultation agreements before coordinating meetings.
  - VOGA provided information on confidentiality and the ability to opt out of the consultation.
- On 5 December 2024, BTAC emailed VOGA to confirm receipt of the consultation, confirm that they were a relevant party, and request further consultation (SI Report, reference 11.1.3).
  - BTAC also provided further details on the consultation process.
- On 21 January 2025, VOGA emailed BTAC to request a copy of BTAC's framework for consultation agreement (SI Report, reference 11.1.4).
- On 21 January 2025, VOGA emailed BTAC to provide copies of previous consultation emails for BTAC's records (SI Report, reference 11.1.5).
- On 6 March 2025, VOGA called BTAC and was advised that VOGA would need to provide a draft funding agreement and that BTAC would suggest the date of the next available meeting (SI Report, reference 11.1.6).
- On 6 March 2025, BTAC emailed VOGA to confirm that proposed cost arrangements would be sent over the coming days and that a suggested meeting date would be provided at that time (SI Report, reference 11.1.7).
- On 6 March 2025, VOGA emailed BTAC to confirm if BTAC required VOGA to provide a draft consultation agreement (SI Report, reference 11.1.8).
- On 7 March 2025, VOGA emailed BTAC to provide detailed maps of the project's operational area and EMBA (SI Report, reference 11.1.9).
  - The email included two attached maps of the native title determination regarding the location of operations and EMBA for this EP (SI Report, reference 11.1.9.1, 11.1.9.2).
- On 31 March 2025, VOGA emailed BTAC to follow up on the proposed consultation agreement, and if BTAC still required a meeting with VOGA (SI Report, reference 11.1.10).
- On 13 May 2025, VOGA emailed BTAC to follow up on the previous consultation and to request if BTAC still required a meeting with VOGA (SI Report, reference 11.1.11).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted

BTAC has advised that they are relevant for consultation and has requested consultation.	VOGA notes that BTAC is relevant for consultation and has commenced consultation with BTAC. Sufficient information to allow informed assessment has already been provided including a Summary and Consultation Information Sheets via email. VOGA has made contact with BTAC via email and on the phone over a 5 month period and considers a reasonable period of time has been provided.	VOGA accepts that BTAC is relevant for consultation in this EP.	VOGA considers the measures and controls in the EP are sufficient. Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with BTAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.
BTAC has advised of its interest in organising a face-to-face meeting and that it requires funding. BTAC has not yet provided cost arrangements.	VOGA seeks to build a relationship and supports ongoing consultation with BTAC on this and other EPs. VOGA will continue to progress a meeting with BTAC upon request to continue consultation on this and other EPs, as outlined in Section 10.4.1 of this EP.	VOGA accepts the interest in a meeting and is currently awaiting further consultation. VOGA is awaiting cost arrangements from BTAC.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
BTAC has not provided any feedback, objections or claims in relation to this activity in consultation to date and to the information provided in December 2024 and January 2025 to which BTAC confirmed receipt.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA accepts that BTAC may not have a comment at this time on the proposed activities under this EP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
Consultation demonstration statement			

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with BTAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided BTAC on 4 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to BTAC on 4 December 2024.
- Maps were provided showing the location and EMBA in relation to the BTAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to BTAC over an eight-month period.
- VOGA has provided BTAC with more than eight months to consult ahead of preparing the EP for submission and intends to continue to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding BTAC of the opportunity to provide feedback.
- VOGA asked for BTAC's input for how BTAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Karajarri Traditional Lands Association (Aboriginal Corporation) RNTBC (KTLA)
Consultation overview and summary of response on this EP

- On 7 October 2024, VOGA called KTLA. The call went unanswered, and a message was left to return the call (SI Report, reference 11.2.1).
- On 9 October 2024, VOGA emailed KTLA to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.2). VOGA advised it welcomes consultation with KTLA regarding these activities.
    - VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
    - VOGA requested KTLA's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
    - VOGA proposed a meeting to discuss the planned activities and provide information.
    - VOGA emphasised a co-design approach for the consultation process to ensure it meets KTLA's needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 3 December 2024, VOGA emailed KTLA advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.22 and 1.3).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
    - VOGA believes KTLA is relevant for consultation and invited them to participate in the process.
    - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
    - VOGA requested formal consultation agreements before coordinating meetings.
    - VOGA provided information on confidentiality and the ability to opt out of the consultation.
    - VOGA attached a map of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.22.1).
- On 10 December 2024, VOGA called KTLA. The call went unanswered, and no message could be left (SI Report, reference 11.2.2).
- On 20 January 2025, VOGA called KTLA. The call went unanswered, and a message was left asking to return the call (SI Report, reference 11.2.3).
- On 20 January 2025, VOGA emailed KTLA requesting the best contact for consultation (SI Report, reference 11.2.4).
- On 21 January 2025, KTLA called VOGA and provided the best contact for consultation. KTLA also advised the next Board meeting in March (SI Report, reference 11.2.5).
- On 21 January 2025, VOGA emailed KTLA to thank them for their call, and to provide the previous consultation emails (SI Report, reference 11.2.6).
    - VOGA also clarified the preference for a potential meeting and requested a consultation agreement if appropriate.
- On 21 February 2025, VOGA called KTLA. The call went unanswered, and a message was left asking to return the call (SI Report, reference 11.2.7).
- On 21 February 2025, VOGA emailed KTLA following up on their previous communications and to request if the planned March meeting was going ahead (SI Report, reference 11.2.8).

- On 6 March 2025, VOGA called KTLA. The call went unanswered, and no message could be left (SI Report, reference 11.2.9).
- On 6 March 2025, VOGA emailed KTLA to confirm the missed call, to follow up on when the next KTLA meeting would occur, and to request a return call (SI Report, reference 11.2.10).
- On 6 March 2025, KTLA called VOGA and advised that KTLA would be holding a meeting on the week commencing 10 March 2025 (SI Report, reference 11.2.11).
    - KTLA also requested that an email be sent as a reminder to see if VOGA could be added to the Agenda.
    - VOGA advised that it would need 30 minutes and could attend remotely.
- On 6 March 2025, VOGA emailed KTLA to thank them for the call, and to request if they would be able to attend the KTLA meeting the following week. VOGA reiterated that 30 minutes would be needed for the meeting, and that they can attend remotely (SI Report, reference 11.2.12).
- On 10 March 2025, VOGA sent a text message to KTLA to request if there was an update for attending the KTLA meeting on the week of 6 March 2025 (SI Report, 11.2.13).
- On 13 March 2025, KTLA sent a text message to VOGA to apologise for the delay and to advise that there would be an internal meeting with the KTLA CEO the following week, at which, VOGA's attendance would be discussed (SI Report, reference 11.2.14).
- On 13 March 2025, VOGA sent a text message to KTLA to thank them for the update, and to suggest whether an introductory meeting with the CEO would be desired (SI Report, reference 11.2.15).
- On 31 March 2025, VOGA sent a text message to KTLA to request any updates on the meeting attendance. VOGA also suggested if it would be easier, VOGA could attend an initial meeting with the KTLA chair or CEO and the KTLA representative (SI Report, reference 11.2.16)
- On 31 March 2025, KTLA sent a text message to VOGA to suggest that VOGA call the KTLA CEO directly, and provided the contact details for the KTLA CEO (SI Report, reference 11.2.17).
- On 31 March 2025, VOGA sent a text message to KTLA to thank them and confirm that they would call the CEO directly (SI Report, reference 11.2.18).
- On 1 April 2025, VOGA called KTLA, the call went unanswered, and a voicemail was left requesting a return call (SI Report, 11.2.19).
- On 1 April 2025, VOGA sent a text message to KTLA requesting a call or a correct email address for further consultation (SI Report, reference 11.2.20).
- On 1 April 2025, KTLA sent a text message to VOGA requesting a contact email from VOGA (SI Report, reference 11.2.20).
- On 1 April 2025, VOGA sent a text message to KTLA providing the correct contact email (SI Report, reference 11.2.20).
- On 5 May 2025, KTLA sent a text message to VOGA to advise that the KTLA meeting would be held on the 14 or 15 May 2025, and asked if VOGA would be interested in attending (SI Report, reference 11.2.21).
- On 5 May 2025, VOGA sent a text message to KTLA requesting the location of the meeting (SI Report, reference 11.2.22).
- On 5 May 2025, KTLA sent a text message to VOGA to advise that the meeting would be held in Broome (SI Report, reference 11.2.23).
- On 5 May 2025, VOGA sent a text message to KTLA to advise that it would request instructions regarding the attendance of the KTLA meeting (SI Report, reference 11.2.24).
- On 6 May 2025, VOGA sent a text message to KTLA to confirm its attendance at the KTLA meeting on 14 May 2025 (SI Report, reference 11.2.25).
- On 6 May 2025, VOGA emailed KTLA to confirm its interest in attending the board meeting on 14 May 2025 and stated that an hour would be required for presentation (SI Report, reference 11.2.26).
- On 6 May 2025, KTLA emailed VOGA to request if VOGA had a budget for consultation, and to request if VOGA had an estimate for consultation with other First Nation groups to assist in the development of costs for the consultation (SI Report, reference 11.2.27).

- On 6 May 2025, KTLA emailed VOGA to provide details for the upcoming meeting on 14 May 2025 and to advise on a potential flight option (SI Report, 11.2.28).
    - KTLA also confirmed that once approved, they would provide a cost estimate for the meeting.
    - The email from KTLA also forwarded an internal KTLA email that provided the details of the meeting, including the date and time.
- On 8 May 2025, VOGA sent a text message to KTLA to request confirmation that the KTLA meeting is being held, and that VOGA can attend on 14 May 2025 (SI Report, reference 11.2.29).
- On 12 May 2025, KTLA emailed VOGA to confirm the invitation to present to the KTLA board on 14 May 2025 in Broome, and to request a copy of the presentation be forwarded for inclusion in the Director Information Package (SI Report, reference 11.2.30).
- On 12 May 2025, KTLA called VOGA to outline the details of the 14 May Board Meeting in Broome, and to confirm the meeting contribution amount (SI Report, reference 11.2.31).
- On 12 May 2025, VOGA emailed KTLA to thank them for the call and to confirm that VOGA would attend the meeting in person and provide a presentation either later in the day or early the next morning. VVOGA also confirmed that the meeting contribution amount was agreed upon (SI Report, reference 11.2.32).
- On 14 May 2025, VOGA travelled to Broome and met with the KTLA at an in-person meeting, at an agreed-upon location within proximity to KTLA's country (SI Report, reference 11.2.33).
    - VOGA provided a presentation to introduce VOGA and its operations in the Wandoo field, planned activities going forward for the operations and possible next steps for consultation with KTLA (SI Report, reference 11.2.33.1).
    - VOGA's presentation included:
        - Background on VOGA and the Wandoo operations, including the marine environment and fauna monitoring around Wandoo.
        - An overview of this EP, including key information on the proposed activities and the project EMBA.
        - Why VOGA seeks to consult with KTLA and the next steps.
        - VOGA outlined the next steps for the EP.
    - During the meeting, KTLA responded and advised on its functions and interests:
        - KTLA asked which platform the crew would be working on, how many people would be there, and where they travelled from.
            - VOGA confirmed that Wandoo B would be staffed with 30 to 50 people, who would fly in and out from Dampier. However, the general operating crew is 25 staff.
        - KTLA asked how deep the wells were
            - VOGA confirmed that the wells are typically 500 metres in depth and provided context on well depths and the technical aspects of how the wells operate.
        - KTLA asked a series of questions regarding the production facility, including inquiries about how often the ships arrive, how the mid-depth buoy operates, and confirmation of whether oil is stored underneath and how much oil VOGA produces daily.
            - VOGA outlined that the ships arrive every three months and explained how the buoy works, as well as why it needs to be positioned underwater to accommodate tidal movements, especially during cyclones. VOGA also explained that the facility produces 4500 barrels a day.
        - KTLA requested information on the facility's safety in the event of a cyclone and inquired about its structural integrity.

- VOGA explained that the facility has experienced several Category 5 cyclones and outlined the process for when a cyclone is expected. VOGA stated that the facility is shut down and down-manned, and that the pipelines are depressurised. VOGA also provided context on project maintenance, noting that the facility's structure has been reviewed and recertified in the event of cyclones, and that no severe damage had occurred.

- KTLA also inquired whether VOGA had a dredge and commented on the method of dredging employed in the Port of Broome, alongside the negative impacts of this event.
  - VOGA confirmed that the facility is situated on sand and has solid soil beneath it, and noted legacy damage from trawling in the area. VOGA also explained that a study has been conducted with UWA to examine marine life in the area, and provided information from UWA studies showing that Wandoo was the best reef in the area and how it can contribute positively to the fish population in the area.
- KTLA expressed interest in VOGA's study with UWA and inquired whether the operation generates acoustics. KTLA also wondered if these acoustic disturbances would impact local fish life and the navigation of marine mammals.
  - VOGA offered to share the UWA study with KTLA. VOGA also noted that Wandoo is not a silent operation, but clarified that noise would have a minimal impact on marine life, and that noise levels do not appear to deter fish and marine mammals from visiting the facility.
- KTLA also inquired about the potential impact of the Leeuwin current.
  - VOGA expressed its desire to provide further details on oil spill monitoring and acknowledged that the meeting time was nearly over. VOGA emphasised its intention to avoid rushing the content and to ensure there was an opportunity for meaningful consultation.
- KTLA also inquired about seismic activities in the field and whether the equipment could withstand such events.
  - VOGA confirmed that the equipment was designed for seismic events or ALE events.

- The meeting was cut short due to time constraints at the meeting venue. Following this, KTLA informed VOGA that there would be another meeting in July. However, there may be some space for VOGA to present the following day.
- KTLA acknowledged and accepted the reasons for VOGA to consult with KTLA and was eager to organise the next discussion.
- KTLA requested a copy of the presentation and shared material in the meantime, and VOGA acknowledged that it wanted to ensure the consultation was conducted properly for KTLA, suggesting it would be best to organise another time to complete the presentation and discussion.
- VOGA acknowledged that it knows that KTLA has a ranger program and that there are topics it wishes to hear from KTLA about.
- KTLA's lawyer said they would advise the following day if there was space in the agenda for VOGA to join the meeting via Teams, as VOGA had to travel back to Perth later in the day.

- On 22 May 2025, VOGA emailed KTLA to confirm the record of text message interactions between representatives of VOGA and KTLA over the course of this consultation. VOGA requested if KTLA could confirm the record dates and details of each record of consultation (SI Report, reference 11.2.34).
- On 23 May 2025, VOGA emailed KTLA following from the meeting in Broome. VOGA requested a confirmed list of the directors who attended the meeting, and provided a copy of the presentation and a map of the region. VOGA also requested when the next board meeting would be held so that VOGA could complete the presentation (SI Report, reference 11.2.35, 11.2.35.1).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
KTLA has expressed support for consultation on this EP, which resulted in a face-to-face initial consultation meeting with KTLA and the scheduling of a follow up meeting.	VOGA accepts KTLA's support for consultation, accompanying consultation meetings, and follow-up meetings.	VOGA has made contact with KTLA via email and on the phone over an 8-month period and considers that a reasonable period of time has been provided. VOGA seeks to build a relationship and supports ongoing consultation with KTLA on this and other EPs, as outlined in Section 10.4.1 of this EP.	VOGA considers the measures and controls in the EP are sufficient.
KTLA has not provided any objections or claims in relation to this activity in consultation to date and information provided in December 2024 to which KTLA confirmed receipt, and consultation presentation delivered in May 2025.	VOGA accepts that KTLA may not have a comment at this time on the proposed activities under this EP.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with KTLA as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with KTLA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided KTLA on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to KTLA on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the KTLA native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to KTLA over an eight-month period.
- VOGA has provided KTLA with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding KTLA of the opportunity to provide feedback.
- VOGA asked for KTLA input into how KTLA would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.
- VOGA has conducted a meeting with KTLA and will continue ongoing consultation with the group.

Kariyarra Aboriginal Corporation RNTBC (KAC)

Consultation overview and summary of response on this EP

- On 10 October 2024, VOGA emailed KAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.7). VOGA advised it welcomes consultation with KAC regarding these activities.
    - VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
    - VOGA requested KAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
    - VOGA proposed a meeting to discuss the planned activities and provide information.
    - VOGA emphasised a co-design approach for the consultation process to ensure it meets KAC's needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 14 October 2024, KAC emailed VOGA to confirm the receipt of the consultation and provide information on consultation requirements (SI Report, reference 11.3.1).
    - The email included a "Consultation Flow Chart" outlining how to proceed with consultation (SI Report, reference 11.3.1.1).
- On 3 December 2024, VOGA emailed KAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.23 and 1.3).

  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
  - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
  - VOGA believes KAC is relevant for consultation and invited them to participate in the process.
  - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
  - VOGA requested formal consultation agreements before coordinating meetings.
  - VOGA provided information on confidentiality and the ability to opt out of the consultation.
  - VOGA attached two maps of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.23.1, 3.23.2).
- On 20 January 2025, VOGA called KAC. The call went unanswered and no message was able to be left (SI Report, reference 11.3.2).
- On 20 January 2025, VOGA emailed KAC to follow up on previous emails, and to advise that a voice message was left (SI Report, reference 11.3.3).
  - The email also requested a potential time to discuss the email materials and requested to meet with KAC.
- On 21 January 2025, KAC emailed VOGA to thank VOGA for their outreach and to advise on availability for a potential meeting in March (SI Report, reference 11.3.4).
  - The email confirmed that a potential meeting would be available on the 10th, 11th, 13th or 14th of March and requested VOGA's preference for a meeting date.
- On 21 January 2025, VOGA emailed KAC to confirm the receipt of meeting dates and to confirm that VOGA would confirm a meeting date shortly (SI Report, reference 11.3.5).
- On 6 March 2025, VOGA called KAC. The call went unanswered, and a voicemail was left requesting a return call (SI Report, reference 11.3.6).
- On 6 March 2025, VOGA emailed KAC to confirm the left voicemail and to request a return call (SI Report, reference 11.3.7).
- On 10 March 2025, KAC emailed VOGA to inform that the regular contact at KAC was away, and that KAC had attempted to reach out to VOGA. The email also requested a return email or call. (SI Report, reference 11.3.8).
- On 13 March 2025, VOGA called KAC in response to the previous consultation email. During the email, KAC advised that VOGA may send an email to assist in arranging a meeting with KAC's negotiation team (SI Report, reference 11.3.9).
- On 13 March 2025, VOGA emailed KAC to thank them for the call and request potential consultation meeting dates (SI Report, reference 11.3.10).
- On 13 March 2025, KAC emailed VOGA to provide the potential meeting date of 17 March 2025, at either 9:30 am or 2:30 pm (SI Report, reference 11.3.11)
- On 14 March 2025, VOGA emailed KAC to accept the proposed time of 9:30 am on 17 March 2025 and stated that the attendees would be provided later in the day (SI Report, reference 11.3.12).
- On 14 March 2025, KAC emailed VOGA to confirm that the time had been sent through and confirmed (SI Report, reference 11.3.13).
- On 17 March 2025, VOGA emailed KAC to reattach the information provided in previous emails to assist with the meeting (SI Report, reference 11.3.14)
- On 17 March 2025, KAC emailed VOGA to thank them for the information, and to confirm that the materials had been sent to the board (SI Report, reference 11.3.15).
- On 17 March 2025, VOGA met with the KAC CEO via Microsoft Teams for an initial consultation meeting (SI Report reference 11.3.16).

- VOGA provided a presentation to introduce VOGA and its operations in the Wandoo field, planned activities going forward for the operations and possible next steps for consultation with KAC (SI Report, reference 11.3.16.1).
- VOGA's presentation included:
  - Background on VOGA and the Wandoo operations, including the marine environment and fauna monitoring around Wandoo.
  - An overview of this EP, including key information on the proposed activities.
  - Why VOGA seeks to consult with KAC and next steps.
  - VOGA outlined the next steps for the EP.
- During the meeting, KAC responded and advised on its functions and interests:
  - Consultation requirements are determined by the level of risk to the Kariyarra People's country.
  - KAC accepted the EMBA modelling and noted the activity's distance from their country.
  - KAC outlined that a ranger program for Kariyarra Country is being developed to address the environmental impacts of similar offshore operations.
  - KAC stated that it is interested in working with operators to co-protect the coastline in the event of a spill and has a cultural responsibility to protect its country. However, the KAC board is concerned about its capacity to protect the land and is interested in joint management opportunities.
- KAC shared information about its cultural values and interests:
  - KAC highlighted the fragility of significant cultural sites along the coastline and provided details about the engravings located there.
  - KAC highlighted that 'Kariyarra Island' is of great significance to the group.
    - VOGA requested more details regarding the island and its location with respect to the maps viewed in the meeting.
    - KAC provided further information about the Island. KAC advised that the island is inside the native title determination and that it becomes an island due to tidal flooding. KAC explained that the island is in a mangrove area, and can be accessed by walking. Kariyarra's elders extensively used it and has cultural significance for KAC.
- KAC confirmed that it would pass VOGA's presentation to the Board and that the next Board meeting was two to three weeks away. KAC outlined that it would inform VOGA of any questions or requests from the Board.

- On 18 March 2025, VOGA emailed KAC to thank them for the meeting, and to provide a copy of the presentation shown at the meeting (SI Report, reference 11.3.17)
- On 31 March 2025, VOGA emailed KAC to follow up on the meeting and to see if the matter was presented to the board and what the potential outcome was (SI Report, reference 11.3.18).
- On 31 March 2025, KAC emailed VOGA to confirm that the board meeting would take place the following week, and that confirmation would be provided after the meeting (SI Report, reference 11.3.19).
- On 31 March 2025, VOGA emailed KAC to thank them for their response (SI Report, reference 11.3.20)
- On 17 April 2025, KAC emailed VOGA to apologise for the delay and to confirm that they were unable to review VOGA yet. KAC confirmed that they would review the matter at their next meeting on 5 May 2025 (SI Report, reference 11.3.21).
- On 9 May 2025, VOGA emailed KAC to follow up on whether they had been discussed at the meeting and to request advice on the next steps for consultation (SI Report, reference 11.3.22).
- On 13 May 2025, KAC emailed VOGA to confirm that VOGA's details were tabled at the recent KAC board meeting on 5 May 2025 (SI Report, reference

11.3.23).
    - KAC outlined that during the meeting, the directors considered a resolution regarding consultations with offshore oil and gas companies broadly, and that the board will be the nominated representatives for all consultations with offshore oil and gas moving forward.
    - KAC also invited VOGA to attend a KAC board meeting to present the materials and take questions from the directors.
    - KAC also provided an updated contact to confirm dates, times and costs for the potential meeting.
- On 13 May 2025, VOGA emailed KAC to thank them for the advice and to confirm that they would contact the updated contact to arrange a meeting (SI Report, reference 11.3.24).
- On 13 May 2025, VOGA emailed KAC and contacted the updated representative requesting suitable dates for a meeting with the board, as well as seeking an estimated cost for the meeting (SI Report, reference 11.3.25).
- On 13 May 2025, KAC emailed VOGA to confirm that the next available date would be 13 June 2025 and to request the duration of the meeting to allow for the estimation of costs (SI Report, reference 11.3.26).
- On 19 May 2025, KAC emailed VOGA to attach a quote for an upcoming board meeting and to confirm that once approved, the time for the meeting would be sent through. Attached to the email was a breakdown of the costs for the meeting (SI Report, reference 11.3.27 and 11.3.27.1).
- On 23 May 2025, VOGA emailed KAC to confirm that the quote for the board meeting was approved (SI Report, reference 11.3.28).
- On 25 May 2025, KAC emailed VOGA to thank them for the confirmation (SI Report, reference 11.3.29).

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
KAC has provided VOGA a consultation flow chart outlining its preferred process for proceeding with meaningful consultation and confirmed receipt of the consultation material. The consultation flow chat included requirements for how information should be presented, KAC's expectations and that funding was required for KAC's participation.	VOGA accepts KAC's flowchart and preferred processes for consultation.	VOGA has commenced consultation with KAC which has resulted in a face-to-face meeting. Sufficient information to allow informed assessment has already been provided including a Summary and Consultation Information Sheets via email and a presentation which has been provided via email. VOGA supports KAC's consultation flow chart and wants to ensure meaningful consultation with KAC.	VOGA considers the measures and controls in the EP are sufficient.

KAC has expressed support for consultation on this EP, which resulted in a face-to-face initial consultation meeting with the KAC CEO and the scheduling of a follow up meeting.	VOGA accepts KAC's support for consultation, accompanying consultation meetings, and follow-up meetings.	VOGA has made contact with KAC via email and on the phone over an 8-month period and considers that a reasonable period of time has been provided. VOGA seeks to build a relationship and supports ongoing consultation with KAC on this and other EPs, as outlined in Section 10.4.1 of this EP.	VOGA considers the measures and controls in the EP are sufficient.
During the meeting, the KAC CEO shared some information on cultural values and sensitivities that are within its native title determination area: KAC has a cultural responsibility to protect the coastline of its country. The coastline features numerous significant cultural sites for KAC, which are considered fragile and include engravings. Kariyarra Island' was cited as a place of cultural importance. It was extensively used by KAC's old people. It is an island that is accessed at lower tide.	VOGA accepts KAC's cultural values and sensitivities within the native title area.	VOGA acknowledged KAC's feedback and information sharing about cultural values, features and sensitivities. VOGA adopts relevant controls to ensure these sensitivities are maintained and respected.	VOGA has noted KAC's cultural values, features and interests in Section 3.7.6.1 of this EP. VOGA considers the measures and controls in the EP are sufficient.

KAC has confirmed that for the level of consultation required, KAC would determine this based on the level of risk to their country. KAC accepted the EMBA modelling and noted that the activity is a distance away from their country. KAC has confirmed that it would like to meet with VOGA after the submission of this EP.	VOGA accepts that KAC has determined the level of consultation required with VOGA and would like to arrange another meeting.	VOGA accepts KAC's assessment of consultation requirements at this time and has confirmed attendance for a meeting after the submission of this EP.	
KAC is interested in working with operators to co-protect the coastline in the event of an oil spill; however, the Board was concerned about capacity issues for protecting the coastline. This is a cultural responsibility for KAC. KAC is developing a ranger program for Kariyarra Country.	VOGA acknowledged KAC's interests in coastline protection and concerns regarding the capacity for environmental protection.	VOGA notes KAC's advice about level of risk and notes its concerns about the unlikely event of an oil spill. VOGA's Exploration and Survey Operations Oil Pollution Emergency Plan (OPEP) is at Appendix 5 of this EP. VOGA will continue to engage with KAC on this matter as part of ongoing consultation (see Section 10.4.1 of this EP).	VOGA considers the measures and controls in the EP to be appropriate.
KAC has not provided any objections or claims in relation to this activity in consultation to date and information provided in December 2024 to which KAC confirmed receipt, and consultation presentation delivered in March 2025.	VOGA accepts that KAC may not have a comment at this time on the proposed activities under this EP.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with KAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with KAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided KAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to KAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the KAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to KAC over an eight-month period.
- VOGA has provided KAC with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.
- KAC has shown an understanding of the proposed activity during a meeting on 17 March 2025.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding KAC of the opportunity to provide feedback.
- VOGA asked for KAC's input into how KAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Malgana Aboriginal Corporation (MAC) (Part A)
Consultation overview and summary of response on this EP

• On 2 October 2024, VOGA called MAC on their registered number. The number was disconnected (SI Report, reference 11.4.1)
• On 9 October 2024, VOGA emailed MAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.6). VOGA advised it welcomes consultation with MAC regarding these activities.
  ○ VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
  ○ VOGA requested MAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
  ○ VOGA proposed a meeting to discuss the planned activities and provide information.
  ○ VOGA emphasised a co-design approach for the consultation process to ensure it meets MAC's needs.
  ○ VOGA also provided information on confidentiality and the option to opt out of the consultation.
• On 3 December 2024, VOGA emailed MAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.24 and 1.3).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
  ○ VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
  ○ VOGA believes MAC is relevant for consultation and has invited them to participate in the process.
  ○ VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
  ○ VOGA requested formal consultation agreements before coordinating meetings.
  ○ VOGA provided information on confidentiality and the ability to opt out of the consultation.
  ○ VOGA attached a map of the native title determination in respect to the location of operations and EMBA for this EP (Record of Consultation, reference 3.24.1).
• On 21 January 2025, VOGA called MAC on their registered number. The number was disconnected (SI Report, reference 11.4.2)
• On 21 January 2025, VOGA emailed MAC and requested a phone call to discuss the previous correspondence (SI Report, reference 11.4.3)
• On 29 April 2025, VOGA emailed MAC to confirm the correct contact for consultation and to forward the previous consultation sent. VOGA also requested a follow-up call to discuss ongoing consultation (SI Report, reference 11.4.4).
• On 13 May 2025, VOGA emailed MAC to follow up on the previous consultation and to request a call (SI Report, reference 11.4.5).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
MAC has not provided feedback, objections to date or claims in response to the information provided in December 2024.	VOGA notes that MAC has yet to advise whether it is relevant for consultation or has any comments at this time on the proposed activities under this EP.	VOGA accepts that MAC has no feedback on the proposed activities at this time. Multiple attempts via phone and email have been made to offer MAC the opportunity to provide feedback on this EP through a co-design approach. Sufficient information to allow informed assessment has already been provided including a Summary and Consultation Information Sheets. VOGA has made contact with MAC via email and on the phone over a 8 month period and has demonstrated reasonable efforts to engage in genuine two way dialogue. MAC has had a reasonable opportunity to participate in consultation and a reasonable period of time has been provided. Relevant persons are not obligated to respond to a titleholder's request to participate in the consultation process. A titleholder is not required to wait indefinitely for a response where	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with MAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

		sufficient information and reasonable period of time has been afforded to the relevant person. VOGA will continue to progress relationship building with MAC and offer a face-to-face engagement with MAC to engage in consultation on this and other EPs, as outlined in Section 10.4.1 of this EP.	

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with MAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided MAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to MAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the MAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to MAC over a eight-month period.
- VOGA has provided MAC with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.

- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding MAC of the opportunity to provide feedback.
- VOGA asked for MAC's input into how MAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Nanda Aboriginal Corporation RNTBC (NAC)

Consultation overview and summary of response on this EP

- On 17 October 2024, VOGA called NAC and requested the correct correspondence contact email. NAC advised the correct representative to contact and that the representative was currently out of the office (SI Report, reference 11.5.1).
- On 17 October 2024, VOGA emailed NAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.11). VOGA advised it welcomes consultation with NAC regarding these activities.
    - VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
    - VOGA requested NAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
    - VOGA proposed a meeting to discuss the planned activities and provide information.
    - VOGA emphasised a co-design approach for the consultation process to ensure it meets NAC's needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 3 December 2024, VOGA emailed NAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.25 and 1.3).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
    - VOGA believes NAC is relevant for consultation and invited them to participate in the process.
    - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
    - VOGA requested formal consultation agreements before coordinating meetings.
    - VOGA provided information on confidentiality and the ability to opt out of the consultation.
    - VOGA attached two maps of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.25.1, 3.25.2).
- On 21 January 2025, VOGA emailed NAC to request a time for a call or a follow-up call (SI Report, reference 11.5.2).
- On 25 January 2025, VOGA called NAC and requested to speak to the representative. NAC informed that the representative was not currently available.

VOGA left a message to return the call (SI Report, reference 11.5.3).

- On 1 April 2025, VOGA called NAC and requested to speak to the designated representative; VOGA was informed that the representative was no longer appropriate and that a new representative had been assigned (SI Report, reference 11.5.4).
- On 1 April 2025, VOGA called NAC. The call went unanswered, and a voicemail was left (SI Report, reference 11.5.5).
- On 1 April 2025, VOGA emailed NAC to confirm the voicemail, forward previous correspondence, and request a follow-up call (SI Report, reference 11.5.6).
- On 1 April 2025, VOGA called NAC and spoke with the new representative. NAC stated that they would provide the necessary information to the board and highlighted the amount that needed to be presented for their consideration. VOGA indicated they would need thirty to forty-five minutes for the presentation (SI Report, reference 11.5.7).
- On 1 April 2025, VOGA emailed NAC to thank them for the call and to attach all previous correspondence (SI Report, reference 11.5.8).
    - VOGA attached two maps of the native title determination with respect to the location of operations and EMBA for this EP (SI Report, reference 11.5.8.1, 11.5.8.2)
- On 9 April 2025, NAC emailed VOGA to confirm a potential date for the next board meeting (SI Report, reference 11.5.9).
    - NAC proposed the dates of 12 May 2025, or 15 May 2025, and requested VOGA's availability on these dates.
    - NAC also requested a meeting fee to cover the meeting costs from the proponents to enable the matter on the meeting agenda.
    - NAC requested how much time VOGA would need to be allocated on the agenda, and to confirm the proposed contribution fee.
- On 14 April 2025, NAC emailed VOGA to follow up on the previous email, and to confirm that the date had been set for the 12 May 2025 (SI Report, reference 11.5.10).
- On 14 April 2025, VOGA emailed NAC to confirm that they would review the date, and to request the location of the meeting (SI Report, reference 11.5.11).
- On 14 April 2025, NAC emailed VOGA to confirm that the meeting would be held in Geraldton (SI Report, reference 11.5.12).
- On 29 April 2025, NAC emailed VOGA to inform VOGA of matters that had come to hand, resulting in the postponement of VOGA's presentation, and requested if VOGA would be open to presenting at the following board meeting. NAC also confirmed that the updated date would be provided once confirmed (SI Report, reference 11.5.13)

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
NAC has not provided feedback, objections to date or claims in response to the information provided in December 2024. VOGA was set to hold a meeting with NAC on 29 April 2025, however the meeting was postponed shortly before the meeting date. VOGA had planned to travel to NAC and had confirmed their attendance at the meeting. VOGA is committed to meeting with NAC to further understand their considerations regarding this EP.	VOGA notes that NAC has yet to advise whether it has any comments at this time on the proposed activities under this EP.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with NAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with NAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided NAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to NAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the NAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

- VOGA has addressed and responded to NAC over a seven-month period.
- VOGA has provided NAC with more than seven months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding NAC of the opportunity to provide feedback.
- VOGA asked for NAC's input into how NAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.
- VOGA sought a meeting with NAC and had planned a meeting to which VOGA would travel to NAC. The meeting was postponed by NAC and VOGA will continue to seek a meeting.

Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC), Yinggarda Aboriginal Corporation (YAC)

Consultation overview and summary of response on this EP

- On 2 October 2024, VOGA called NTGAC, who advised the appropriate contact details for further consultation (SI Report, reference 11.6.1).
  - On the call, NTGAC advised the process for consultation and that NTGAC was low on time for the remainder of the year.
- On 9 October 2024, VOGA emailed NTGAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.3). VOGA advised it welcomes consultation with NTGAC regarding these activities.
  - VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
  - VOGA requested NTGAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
  - VOGA proposed a meeting to discuss the planned activities and provide information.
  - VOGA emphasised a co-design approach for the consultation process to ensure it meets NTGAC's needs.
  - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 28 October 2024, NTGAC emailed VOGA to confirm the receipt of the consultation and provided information on consultation requirements (SI Report, reference 11.6.2).
- On 6 November 2024, VOGA emailed NTGAC to thank them for their response and request a proposed meeting date for February (SI Report, reference 11.6.3).

- On 3 December 2024, VOGA emailed NTGAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.26 and 1.3).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
    - VOGA believes NTGAC is relevant for consultation and invited them to participate in the process.
    - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
    - VOGA requested formal consultation agreements before coordinating meetings.
    - VOGA provided information on confidentiality and the ability to opt out of the consultation.
    - VOGA attached two maps of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.26.1, 3.26.2).
- On 21 January 2025, VOGA called NTGAC. The call went unanswered, and a message was left requesting a return call (SI Report, reference 11.6.4).
- On 21 January 2025, VOGA emailed NTGAC to confirm that it had left a voice message and requested a callback to confirm details of the next NTGAC board meeting (SI Report, reference 11.6.5).
- On 27 January 2025, NTGAC emailed VOGA to confirm the receipt of the email and advise that they would aim to respond in the afternoon (SI Report, reference 11.6.6).
- On 5 February 2025, NTGAC called VOGA and provided an update on the upcoming board meeting (SI Report, reference 11.6.7).
- On 5 February 2025, NTGAC emailed VOGA to confirm a call made by NTGAC to VOGA, and to finalise the agenda for the NTGAC Carnarvon Board meeting on the 17th of February (SI Report, reference 11.6.8).
    - The email requested confirmation of suitability and potential attendance via Microsoft Teams or in person. It confirmed an additional meeting in the first week of April if the date was unsuitable.
    - The email also provided a request for financial contribution in return for attendance at the meeting and an estimated cost. The email also requested confirmation if VOGA was able to attend.
- On 6 February 2025, VOGA emailed NTGAC to confirm their attendance at the Board meeting on 17 February via Microsoft Teams. VOGA also confirmed the meeting contribution and stated the names of attendees would be provided the following week (SI Report, reference 11.6.9).
- On 7 February 2025, NTGAC emailed VOGA to provide a contribution invoice for the 17 February meeting and clarified that the contribution was a one-off (SI Report, reference 11.6.10).
    - Attached to the email are the full invoice details (SI Report, reference 11.6.10.1)
- On 10 February 2025, VOGA emailed NTGAC requesting them to complete and return a vendor questionnaire attached to assist in the processing of payment ahead of the 17 February Board Meeting (SI Report, reference 11.6.11, 11.6.12.1).
- On 10 February 2025, NTGAC emailed VOGA to confirm the completion of the attached documents, and an updated bank statement details document was attached (SI Report, reference 11.6.12, 11.6.12.1, and 11.6.12.2).
- On 11 February 2025, NTGAC emailed VOGA to inform VOGA that a Board pack was being compiled ahead of the meeting and requested if there was any information VOGA would like to provide the Board regarding this EP (SI Report, reference 11.6.13).

- On 11 February 2025, VOGA emailed NTGAC confirming that information would be provided in the form of a presentation and relevant maps, and that VOGA would provide the information ahead of the 17 February meeting (SI Report, reference 11.6.14).
- On 12 February 2025, VOGA emailed NTGAC regarding the returned vendor questionnaire and thanked NTGAC (SI Report, reference 11.6.15).
- On 13 February 2025, VOGA emailed NTGAC to provide materials before the meeting (SI Report, reference 11.6.16).
    - These materials included the presentation slides to be shown at the meeting, a series of maps included in the presentation, the Summary Information Sheet, and notice that a video would be shown as part of the marine life presentation around the project. (Record of Consultation, reference 1.3) (SI Report, reference 11.6.19.1).
- On 14 February 2025, NTGAC emailed VOGA to thank them for the information and confirmed that the documents would be printed before the meeting. (SI Report, reference 11.6.17)
- On 14 February 2025, VOGA emailed NTGAC to thank them for the confirmation (SI Report, reference 11.6.18)
- On 17 February 2025, VOGA met with NTGAC for an initial consultation meeting (SI Report, reference 11.6.19).
    - VOGA provided a presentation with background on Wandoo, operations, and activities going forward for the operations. VOGA also outlined the next steps for consultation with NTGAC (SI Report, reference 11.6.19.1).
    - VOGA's presentation included:
    - Background on VOGA and the Wandoo operations, including the marine environment and fauna around Wandoo.
    - An overview of this EP, including key information on the proposed activities.
        - VOGA provided key information on project timing, duration and potential risks for this EP.
    - Why VOGA seeks to consult with NTGAC and next steps.
    - During the meeting, NTGAC advised that they would speak following the meeting and advise if consultation was necessary with VOGA.
    - NTGAC stated its preferred consultation approach was initiating a consultation agreement.
        - During the meeting, NTGAC asked if VOGA had any plans to construct a new platform, to which VOGA explained that there is no need to build a new platform and no current plan in place to do so.
        - NTGAC also asked what the platform's life was for this EP, to which VOGA responded and advised that the field's current life could change depending on the result of this EP.
- On 5 March 2025, NTGAC emailed VOGA to follow up on the invoice and to request a copy of remittance advice if paid (SI Report, reference 11.6.20).
- On 6 March 2025, VOGA emailed NTGAC to confirm that the invoice had been processed, and would be paid in the next cycle (SI Report, reference 11.6.21)
- On 6 March 2025, NTGAC emailed VOGA to thank them for the update (SI Report, reference 11.6.22).
- On 7 March 2025, VOGA emailed NTGAC to request an update on the meeting's outcome (SI Report, reference 11.6.23).
- On 7 March 2025, NTGAC emailed VOGA to confirm the progress of a consultancy agreement with VOGA, and confirmed that the agreement could be agreed upon without a negotiation meeting (SI Report, reference 11.6.24).
    - The email confirmed that NTGAC would draft an agreement and circulate over the coming days.
- On 7 March 2025, VOGA emailed NTGAC to thank them for the update and confirm that It would await a consultancy agreement from NTGAC (SI Report, reference 11.6.25).
- On 31 March 2025, VOGA emailed NTGAC to follow up on the potential draft agreement (SI Report, reference 11.6.26).

- On 7 April 2025, NTGAC emailed VOGA to apologise for the delay, and that NTGAC was awaiting approval on a statement of works, after which a cost estimate and draft agreement would be sent. NTGAC stated that this should be provided within the week (SI Report, reference 11.6.27)
- On 9 May 2025, VOGA emailed NTGAC to request a copy of the draft agreement (SI Report, reference 11.6.28).

Consultation with YAC

- On 21 January 2025, VOGA emailed YAC to request a time to speak following discussions with NTGAC. VOGA sought to understand the relationship between YAC and NTGAC as part of the Gnulli, Gnulli #2, and Gnulli #3 determination area. VOGA requested times for a call (SI Report, reference 11.7.1)
- On 23 May 2025, VOGA called YAC to follow up on the previous consultation information, and confirmed with YAC that they would send an additional follow up email (SI Report, reference 11.7.2).
- On 23 May 2025, VOGA emailed YAC to thank them for their time, and to provide further information on this EP. VOGA also confirmed that it sought to understand the relationship between YAC and NTGAC as part of the Gnuli, Gnulli #2 and Gnulli #3 determination area (SI Report, reference 11.7.3).
- On 23 May 2025, YAC emailed VOGA to thank them for the call, and to request an information pack to be presented to the YAC board at their next meeting. YAC confirmed that they would confirm the next steps for consultation shortly (SI Report, reference 11.7.4).
- On 27 May 2025, VOGA emailed YAC to thank them for their reply and to advise of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (SI Report, reference 11.7.5)(Record of Consultation, Reference 1.3).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
    - VOGA believes YAC is relevant for consultation and invited them to participate in the process.
    - VOGA proposed a meeting to discuss the proposed activities, seek input, and engage in consultation.
    - VOGA requested formal consultation agreements before coordinating meetings.
    - VOGA provided information on confidentiality and the ability to opt out of the consultation.
    - VOGA attached two maps of the native title determination in respect to location of operations and EMBA for this EP (SI Report, reference 11.7.5.1 and 11.7.5.2).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
NTGAC and YAC have expressed support for consultation on this EP, which resulted in a face-to-face initial consultation meeting with YAC and the scheduling of a follow-up meeting.	VOGA accepts NTGAC and YAC's support for consultation, accompanying consultation meetings, and follow-up meetings.	VOGA has made contact with NTGAC and YAC via email and on the phone over an 8-month period and considers that a reasonable period of time has been provided. VOGA seeks to build a relationship and supports ongoing consultation with NTGAC and YAC on this and other EPs, as outlined in Section 10.4.1 of this EP.	VOGA considers the measures and controls in the EP are sufficient.
NTGAC and YAC have not provided any objections or claims in relation to this activity in consultation to date and information provided in December 2024 to which NTGAC and YAC confirmed receipt, and consultation presentation delivered in May 2025.	VOGA accepts that NTGAC and YAC may not have a comment at this time on the proposed activities under this EP.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with NTGAC and YAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with NTGAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided NTGAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to NTGAC on 3 December 2024.

- Maps were provided showing the location and EMBA in relation to the NTGAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to NTGAC over an eight-month period.
- VOGA has provided NTGAC with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.
- NTGAC has shown an understanding of the proposed activity during a meeting on 17 February 2025.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding NTGAC of the opportunity to provide feedback.
- VOGA asked for NTGAC's input into how NTGAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Ngarluma Aboriginal Corporation RNTBC (NAC)

Consultation overview and summary of response on this EP

- On 2 October 2024, VOGA called NAC and was advised the best contact person for ongoing consultation (SI Report, reference 11.8.1).
- On 9 October 2024, VOGA emailed NAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.5). VOGA advised it welcomes consultation with NAC regarding these activities.
    - VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
    - VOGA requested NAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
    - VOGA proposed a meeting to discuss the planned activities and provide information.
    - VOGA emphasised a co-design approach for the consultation process to ensure it meets NAC's needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 3 December 2024, VOGA emailed NAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.27 and 1.3).

- The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
- VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
- VOGA believes NAC is relevant for consultation and invited them to participate in the process.
- VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
- VOGA requested formal consultation agreements before coordinating meetings.
- VOGA provided information on confidentiality and the ability to opt out of the consultation.
- VOGA attached two maps of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.27.1, 3.27.2).

- On 20 January 2025, VOGA called NAC to clarify the contact details for consultation. NAC provided a new contact person for ongoing consultation (SI Report, reference 11.8.2).
- On 20 January 2025, VOGA emailed NAC to provide background on the Wandoo facility and follow up on a call to NAC. In the email, VOGA requested a follow-up call to discuss further consultation (SI Record, reference 11.8.3).
- On 6 March 2025, VOGA called NAC and left a message to receive a callback from the relevant NAC representative (SI Report, reference 11.8.4).
- On 6 March 2025, VOGA emailed NAC to confirm the voice message left and to request a return call (SI Report, reference 11.8.5).
- On 31 March 2025, VOGA called NAC and requested to speak to the relevant representative. NAC advised that they were not available. VOGA requested if there was a Future Act Officer or Lawyer in the office. NAC advised that the representative provided was the only relevant representative. VOGA asked if it was best to leave a message or send an email, and was informed that an email was the best course of action (SI Report, reference 11.8.6).
- On 31 March 2025, VOGA emailed NAC to follow up on the previous emails and to advise of the missed call. VOGA also requested a call back (SI Report, reference 11.8.7).
- On 9 May 2025, VOGA emailed NAC to follow up on the previous consultation and to request a phone call (SI Report, reference 11.8.8).

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
While contact was made with NAC in October 2024, no response was received for consultation on this EP despite follow up.	VOGA notes that NAC has yet to advise whether it is relevant for consultation or has any comments at this time on the proposed activities under this EP.	VOGA accepts that NAC has no feedback on the proposed activities at this time. Multiple attempts via phone and email have been made to offer NAC the opportunity to provide feedback on this EP through a co-design approach.	VOGA considers the measures and controls in the EP are sufficient.

		Sufficient information to allow informed assessment has already been provided including a Summary and Consultation Information Sheets. VOGA has made contact with NAC via email and on the phone over a 5 month period and has demonstrated reasonable efforts to engage in genuine two way dialogue. NAC has had a reasonable opportunity to participate in consultation and a reasonable period of time has been provided. Relevant persons are not obligated to respond to a titleholder's request to participate in the consultation process. A titleholder is not required to wait indefinitely for a response where sufficient information and reasonable period of time has been afforded to the relevant person. VOGA will continue to progress relationship building with NAC and offer a face-to-face engagement with NAC to engage in consultation on this and other EPs, as outlined in Section 10.4.1 of this EP.	

NAC has not provided feedback, objections to date or claims in response to the information provided in December 2024.	VOGA accepts that NAC may confirm it is relevant for consultation and may have comments on the proposed activities under this EP.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with NAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with NAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided NAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to NAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the NAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to NAC over an eight-month period.

- VOGA has provided NAC with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding NAC of the opportunity to provide feedback.
- VOGA asked for NAC's input into how NAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Nyangumarta Karajarri Aboriginal Corporation RNTBC (NKAC)

Consultation overview and summary of response on this EP

- On 7 October 2024, VOGA called NKAC and requested to speak to the relevant representative. NKAC advised that they were unavailable. VOGA left a message for a return call (SI Report, reference 11.9.1).
- On 14 October 2024, VOGA emailed KNAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.10). VOGA advised it welcomes consultation with KNAC regarding these activities.
    - VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
    - VOGA requested KNAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
    - VOGA proposed a meeting to discuss the planned activities and provide information.
    - VOGA emphasised a co-design approach for the consultation process to ensure it meets KNAC's needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 3 December 2024, VOGA emailed NKAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.28 and 1.3).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
    - VOGA believes NKAC is relevant for consultation and invited them to participate in the process.
    - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.

  - VOGA requested formal consultation agreements before coordinating meetings.
  - VOGA provided information on confidentiality and the ability to opt out of the consultation.
  - VOGA attached a map of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.28.1).
- On 11 December 2024, NKAC emailed VOGA to advise that it would not be able to comment until after the next directors' meeting, which may occur in the second quarter of 2025 (SI Report, reference 11.9.2).
- On 14 February 2025, VOGA emailed an affiliate of NKAC to thank them for their assistance to date (SI Report, reference 11.9.3).
  - VOGA provided the initial emails and requested that VOGA be present at the next board meeting or if there was a better contact person for ongoing consultation.
- On 17 February 2025, VOGA emailed NKAC to provide an overview of VOGA's operations, and to forward previous consultation (SI Report, reference 11.9.4)
  - VOGA also requested if a call could be made, to provide further information and to understand if NKAC would like for VOGA to attend a meeting with their board. Attached to the email was the consultation information sheet (Record of Consultation, reference 1.1).
- On 21 February 2025, VOGA emailed NKAC to follow up on the previous consultation and request a time to discuss it over the phone (SI Report, reference 11.9.5).
  - VOGA attached a map of the native title determination with respect to the location of operations and EMBA for this EP (SI Report, reference 11.9.5.1).
- On 21 February 2025, NKAC emailed VOGA to confirm that the documents will be raised with the board at the next meeting (SI Report, reference 11.9.6).
- On 21 February 2025, VOGA emailed NKAC to thank them for their response and to offer a presentation at the next board meeting (SI Report, reference 11.9.7).
- On 31 March 2025, VOGA emailed NKAC to confirm if the matter was raised at the board meeting. VOGA offered a call to discuss the matter further (SI Report, reference 11.9.8).
- On 9 April 2025, NKAC emailed VOGA to confirm that it could not be raised at the last meeting. NKAC confirmed that VOGA would be discussed when planning the next board meeting (SI Report, reference 11.9.9).
- On 9 May 2025, VOGA called NKAC, no answer was made and a voicemail was left requesting a return call (SI Report, reference 11.9.10).
- On 9 May 2025, VOGA emailed NKAC to follow up if the board had considered a potential meeting or if there was a board meeting coming up that VOGA could present at. VOGA also requested a phone call to discuss (SI Report, reference 11.9.11).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
NKAC has not provided feedback, objections to date or claims in response to the information provided in December 2024. VOGA is in the progress of scheduling a meeting with NKAC.	VOGA notes that NKAC may have comments on the proposed activities under this EP.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with NKAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with NKAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided NKAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to NKAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the NKAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to NKAC over a eight-month period.
- VOGA has provided NKAC with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding NKAC of the opportunity to provide feedback.
- VOGA asked for NKAC's input into how NKAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Nyangumarta Warrarn Aboriginal Corporation RNTBC (NWAC)

Consultation overview and summary of response on this EP

- On 17 October 2024, VOGA called NWAC to request the correct contact email for consultation (SI Report, reference 11.10.1).
- On 17 October 2024, VOGA emailed NWAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.12). VOGA advised it welcomes consultation with NWAC regarding these activities.
    - VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
    - VOGA requested NWAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
    - VOGA proposed a meeting to discuss the planned activities and provide information.
    - VOGA emphasised a co-design approach for the consultation process to ensure it meets NWAC's needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 22 October 2024, NWAC emailed VOGA to thank them for the initial email and to provide information on the potential consultation process (SI Report, reference 11.10.2).
    - NWAC stated that they would assess the necessity of consultation and confirmed that there would be a cost involved in a potential meeting if required.
- On 22 October 2024, VOGA called NWAC and spoke with the NWAC representative. NWAC advised that the group was approaching their first consultation with another proponent (SI Report, reference 11.10.3).
- On 3 December 2024, VOGA emailed NWAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.29 and 1.3).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.

  - VOGA believes NWAC is relevant for consultation and invited them to participate in the process.
  - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
  - VOGA requested formal consultation agreements before coordinating meetings.
  - VOGA provided information on confidentiality and the ability to opt out of the consultation.
  - VOGA attached a map of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.29.1).
- On 17 January 2025, VOGA called NWAC, but the call went unanswered, and a message was left for the call to be returned (SI Report, reference 11.10.4).
- On 20 January 2025, VOGA called NWAC; NWAC acknowledged the previous missed calls and emails received; however, they advised that they were unable to speak at the time. NWAC stated they would call back later in the week (SI Report, reference 11.10.5).
- On 23 January 2025, VOGA emailed NWAC to follow up on the previous emails and to request a time to discuss the consultation process (SI Report, reference 11.10.6).
- On 23 January 2025, NWAC emailed VOGA to confirm they would respond shortly (SI Report, reference 11.10.7).
- On 4 February 2025, NWAC emailed VOGA, to ask if VOGA was free on Monday at 1:00 pm for a meeting (SI Report, reference 11.10.8)
- On 4 February 2025, VOGA emailed NWAC to confirm they were available for the meeting and verified that meeting attendees would be provided the next day (SI Report, reference 11.10.9).
- On 4 February 2025, NWAC emailed VOGA to thank them for their reply (SI Report, reference 11.10.10).
- On 5 February 2025, VOGA emailed NWAC to confirm the attendees for the 10 February 2025 meeting (SI Report, reference 11.10.11).
- On 5 February 2025, NWAC emailed VOGA to confirm that VOGA would have an hour at the meeting from 1:00 pm and to provide details regarding the meeting attendance (SI Report, reference 11.10.12).
  - NWAC also confirm the estimated cost of the meeting. NWAC clarified that the cost alleviates the impact on the PBC in covering meeting expenditure and follow-ups.
  - NWAC requested if VOGA was happy to continue with the meeting following the fees.
- On 10 February 2025, VOGA met with NWAC and YMAC for an initial consultation meeting (SI Report, reference 11.10.13).
  - VOGA provided a presentation with background on Wandoo's operations and activities going forward. VOGA also outlined the next steps for consultation with NWAC (SI Report, reference 11.10.13.1).
  - VOGA's presentation included:
  - Background on VOGA and the Wandoo operations, including the marine environment and fauna around Wandoo.
    - NWAC asked what native title determination Barrow Island was; VOGA did not have the answer but mentioned it had contacted groups in the area.
    - NWAC also asked if VOGA engages with DBCA because its rangers are employed with DBCA for the 80-mile beach. NWAC stated its interest in marine parks and monitoring. NWAC shared local contacts at DBCA with whom VOGA could discuss this.
    - NWAC also requested that VOGA engage for its five-yearly surveys. VOGA confirmed it uses a consultant from Perth.
  - An overview of this EP, including key information on the proposed activities.
    - VOGA provided key information on project timing, duration and potential risks for this EP.

- Why VOGA seeks to consult with NWAC and next steps.
- VOGA also asked NWAC regarding the Nyangumarta-Karajarri overlap, and how to best consult with the PBC. VOGA shared an additional EMBA map for this EP showing the EMBA in relation to the PBC's Native Title Determination.
  - NWAC confirmed its interest in the PBC and provided engagement advice, including contact details.
  - VOGA asked how often the Yawinya PBC meets, to which NWAC confirmed the first meeting would be in April.
  - NWAC asked if VOGA was engaging with other nearby groups. VOGA confirmed it was.
- VOGA provided an overview of this EP and explained key information about the activity. VOGA also provided potential risks and key details regarding previous drilling campaigns. VOGA also shared information on how exploration drilling works and how the Jack-up Mobile Offshore rig works.
- Following the meeting, NWAC asked a series of questions:
  - NWAC requested details on the total life of the Wandoo Field. VOGA outlined that the field life is until 2035 if the campaign is unsuccessful and that if successful, the campaign would run for longer.
  - NWAC also asked and confirmed if VOGA was drilling for oil and gas. VOGA confirmed it was primarily looking for oil; however, some gas may be extracted to power the facility.
  - NWAC and YMAC asked if this was the first EP that VOGA submitted following the regulation change.
  - YMAC stated that some groups may not have the resources to respond to EP consultation needs.
  - NWAC and YMAC requested how many EP's VOGA had coming up. VOGA confirmed that there was a low volume of EP's.
  - NWAC shared its standard approach to consultation, including a consultation agreement, for this form of consultation.
  - NWAC also confirmed it would have a discussion internally to decide on the next steps for engagement.
  - VOGA requested information on the next board meeting, to which NWAC confirmed it would be at the end of March.
  - VOGA also requested feedback on the presentation from YMAC. YMAC outlined that titleholders are doing a good job, but the material lacks a gap in addressing cultural impacts.
  - VOGA also confirmed that these gaps are the reason they requested to speak with YMAC. From this, YMAC shared that a good approach would be to find a cultural report to outline gaps in cultural values from EP.
  - NWAC also asked about what fluids VOGA used in the drilling campaign. VOGA outlined that the fluids used a water-based mud bentonite composed of natural clay. VOGA shared that it also uses PHPA mud, which captures cuttings to make them less dispersible in mud. VOGA clarified that this ensures more pressure so there is no loss of well control.
    - NWAC asked if VOGA had any spills in the production at the facility.
    - VOGA clarified that a minor spill had been reported to NOPSEMA.
    - NWAC asked how many litres were spilled, to which VOGA confirmed it was roughly two litres.
  - NWAC requested more information on the marine monitoring VOGA undertakes at UWA, shared more information on its ranger monitoring for turtle habitats, and requested that the UWA research be shared with its rangers. VOGA confirmed that UWA published journals with the monitoring results and would be happy to share these with NWAC. NWAC confirmed that it would be interested in Benthic Fauna in the mud for its monitoring.
  - NWAC also asked where the oil is taken from the production facility. VOGA shared background information on the field export and advised that it is exported exclusively to Japan. VOGA advised that there are dedicated refineries owned by families in Japan that take

crude oil from Wandoo.
    - NWAC and YMAC advised that the further consultation steps would be provided following the meeting.
- On 12 February 2025, VOGA emailed NWAC to thank them for the meeting and attach the presentation and maps shown in it. VOGA also requested that the information be passed to one of the meeting attendees (SI Report, reference 11.10.14).
- On 27 February 2025, VOGA emailed NWAC to request a representative's contact email and seek an update on NWAC's decision following the meeting (SI Report, reference 11.10.15).
- On 27 February 2025, NWAC emailed VOGA to provide the email address (SI Report, reference 11.10.16).
- On 27 February 2025, VOGA emailed NWAC to seek feedback following the meeting with NWAC (SI Report, reference 11.10.17).
- On 31 March 2025, VOGA called NWAC and requested to speak to the NWAC representative. NWAC's office advised that the representative was unavailable and suggested emailing (SI Report, reference 11.10.18).
- On 31 March 2025, VOGA emailed NWAC to follow up on the call and request an additional call to discuss the meeting's outcomes (SI Report, reference 11.10.19).
- On 1 May 2025, NWAC emailed VOGA to provide an update following the meeting and to share a document outlining the legal cost estimate for the negotiation of the consultation protocol between NWAC and VOGA. (SI Report, reference 11.10.20).
    - NWAC outlined that the protocol would allow for effective consultation with NWAC and VOGA, and once confirmed, NWAC would prepare a draft protocol for VOGA's consideration, and arrange a time to negotiate the terms.
    - NWAC requested that, until the Consultation Protocol was completed, all contact should be made with NWAC's legal representative.
    - The document attached outlined the scope of work under the legal cost disclosure, the accompanying fees related, and the relevant parties (SI Report, reference 11.10.20.1).
- On 6 May 2025, VOGA emailed NWAC to thank them for the legal cost estimate, and to confirm that VOGA would review and revert at a later date (SI Report, reference 11.10.21).
- On 13 May 2025, NWAC emailed VOGA to follow up on the legal cost estimate (SI Report, reference 11.10.22).
- On 15 May 2025, VOGA emailed NWAC to confirm the agreement of legal costs with YMAC on behalf of NWAC, and to request that the agreement was drafted in such a way that it could be utilised by additional groups that YMAC acted for (SI Report, reference 11.10.23).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
NWAC have not provided any feedback, objections or claims in relation to this activity in consultation to date in a face-to-face meeting and information provided via email. At the meeting NWAC asked a number of questions about VOGA's plans which were responded to.	VOGA has commenced consultation with NWAC which resulted in a face-to-face meeting. VOGA seeks to establish a consultation agreement with NWAC and supports ongoing consultation with NWAC on this and other EPs. Consultation is still ongoing with NWAC.	VOGA continues consultation with NWAC.	VOGA considers the measures and controls in the EP are sufficient.
During a meeting with NWAC, NWAC requested that VOGA engage for its five-yearly surveys.	VOGA acknowledged NWAC's request to engage in the five-yearly surveys.	VOGA advised NWAC that it has a consultant in Perth who will undertake the survey.	VOGA considers the measures and controls in the EP are sufficient.
NWAC has advised its preferred process for consultation with VOGA during the meeting and has provided a draft consultancy protocol.	VOGA accepts NWAC's request for a consultancy protocol.	Sufficient information to allow informed assessment has already been provided including a Summary and Consultation Information Sheets and a presentation which was also provided via email. VOGA has been in contact with NWAC for a 8 month period and considers a reasonable period of time has been provided. VOGA engages in ongoing consultation throughout the life of	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with NWAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

		an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	
NWAC have expressed support for consultation on this EP, which resulted in a face-to-face initial consultation meeting with NWAC and the scheduling of a follow-up meeting.	VOGA accepts NWAC's support for consultation, accompanying consultation meetings, and follow-up meetings.	VOGA has made contact with NWAC via email and on the phone over an 8-month period and considers that a reasonable period of time has been provided. VOGA seeks to build a relationship and supports ongoing consultation with NWAC on this and other EPs, as outlined in Section 10.4.1 of this EP.	VOGA considers the measures and controls in the EP are sufficient.
NWAC have not provided any objections or claims in relation to this activity in consultation to date and information provided in December 2024 to which NWAC confirmed receipt, and consultation presentation delivered in May 2025.	VOGA accepts that NWAC's may not have a comment at this time on the proposed activities under this EP.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with NWAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.
Consultation demonstration statement			
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with NWAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:			

Sufficient Information

- Consultation information provided NWAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to NWAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the NWAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to NWAC over an eight-month period.
- VOGA has provided NWAC with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.
- NWAC has shown an understanding of the proposed activity during a meeting on 10 February 2025.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding NWAC of the opportunity to provide feedback.
- VOGA asked for NWAC's input into how NWAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Wanparta Aboriginal Corporation RNTBC (WAC)
Consultation overview and summary of response on this EP

• On 2 October 2024, VOGA called WAC, but no response was received, and a message was left for a return call (SI Report, reference 11.11.1).
• On 9 October 2024, VOGA emailed WAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.1). VOGA advised it welcomes consultation with WAC regarding these activities.
  ○ VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
  ○ VOGA requested WAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
  ○ VOGA proposed a meeting to discuss the planned activities and provide information.
  ○ VOGA emphasised a co-design approach for the consultation process to ensure it meets WAC's needs.
  ○ VOGA also provided information on confidentiality and the option to opt out of the consultation.
• On 15 October 2024, WAC called VOGA to provide details regarding an upcoming consultation meeting (SI Report, reference 11.11.2).
  ○ The call included details relating to the cost of a meeting and the location and provided the next available meeting date of 13 December 2024.
  ○ The call also clarified that if no further consultation is required after a meeting, the group will provide a letter.
• On 25 October 2024, WAC emailed VOGA to confirm the receipt of the consultation and provide information on consultation requirements (SI Report, reference 11.11.3).
  ○ The email outlined an estimate for a Directors meeting on 13 December 2024 (SI Report, reference 11.11.3.1).
  ○ The email also requested a map of the project EMBA.
• On 11 November 2024, WAC emailed VOGA to inform them that the proposed meeting date would need to be postponed (SI Report, reference 11.11.4).
  ○ The email stated that WAC would advise of the first available meeting date in 2025.
• On 12 November 2024, VOGA emailed WAC to thank them for the meeting estimate and coordinating upcoming discussions. The email requested a potential meeting in February and a proposed date (SI Report, reference 11.11.5).
  ○ VOGA also stated that it will provide a map of the EMBA to be circulated.
• On 19 November 2024, WAC emailed VOGA to confirm the receipt of email and to advise that potential meeting dates would be provided (SI Report, reference 11.11.6).
• On 3 December 2024, VOGA emailed WAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.30 and 1.3).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
  ○ VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
  ○ VOGA believes WAC is relevant for consultation and invited them to participate in the process.

  - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
  - VOGA requested formal consultation agreements before coordinating meetings.
  - VOGA provided information on confidentiality and the ability to opt out of the consultation.
  - VOGA attached two maps of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.30.1, 3.30.2).
- On 5 December 2024, WAC emailed VOGA to thank them for the provided details and to confirm the receipt of the mapped project EMBA. The email also noted that a potential meeting date would be provided shortly (SI Report, reference 11.11.7).
- On 20 January 2025, VOGA emailed WAC to confirm if a meeting date was available or had been set for February (SI Report, reference 11.11.8).
- On 6 March 2025, VOGA called WAC to follow up on a potential meeting date, the call went unanswered and a voicemail was left (SI Report, reference 11.11.9).
- On 6 March 2025, VOGA emailed WAC to inform them of the call, and requested a return call to discuss the next available meeting (SI Report, reference 11.11.10).
- On 6 March 2025, WAC emailed VOGA to confirm that WAC would send potential meeting dates for early April or early May over the next few days (SI Report, reference 11.11.11).
- On 6 March 2025, VOGA emailed WAC to thank them for their confirmation (SI Report, reference 11.11.12).
- On 10 March 2025, WAC emailed VOGA to inform them that due to a proponent of scheduling, the potential meeting dates would be sent to VOGA later in the week (SI Report, reference 11.11.13).
- On 11 March 2025, WAC emailed VOGA to provide potential meeting times for a half day meeting in Perth. The times were for Tuesday, 6 May 2025 (SI Report, reference 11.11.14).
- On 12 March 2025, VOGA emailed WAC to thank them for the suggested dates, and advised that they would be able to attend on 6 May 2025. VOGA also confirmed that a specific time preference would be provided shortly and requested a budget estimate (SI Report, reference 11.11.15)
- On 12 March 2025, VOGA emailed WAC advising that the 9:30 am time slot was preferred by VOGA (SI Report, reference 11.11.16)
- On 12 March 2025, WAC emailed VOGA confirming the time slot, and clarified that they would contact VOGA regarding further details and the meeting agenda (SI Report, reference 11.11.17).
- On 31 March 2025, VOGA emailed WAC to follow up on the potential meeting costs (SI Report, reference 11.11.18).
- On 2 April 2025, WAC emailed VOGA to confirm the meeting costs would be sent shortly (SI Report, reference 11.11.19).
- On 14 April 2025, WAC emailed VOGA to provide the meeting cost estimate and to request the approval of the estimate and a 50% upfront invoice for the estimate (SI Report, reference 11.11.20).
  - Attached to the email was an invoice for the May 6th meeting, which highlighted the cost for travel, accommodation, meals, venue hire, and other expenses. The invoice also outlined the attendees for the meeting (SI Report, reference 11.11.20.1).
- On 17 April 2025, VOGA emailed WAC to request if WAC had meetings planned in Port Hedland in the near future, and to request a call (SI report, reference 11.11.21).
- On 17 April 2025, VOGA emailed WAC to confirm that the cost estimate had been agreed (SI Report, reference 11.11.22).
- On 22 April 2025, WAC emailed VOGA to attach an onboarding form for the estimate ahead of the meeting on the 6th May 2025 (SI Report, reference 11.11.23).

- WAC attached the initial meeting cost estimate to the email (SI Report, reference 11.11.23.1).
- Additionally, WAC included the onboarding form requesting company details, account details, bank details, and requested proof of banking details (SI Report, reference 11.11.23.2).

- On 23 April 2025, VOGA emailed WAC to return the completed onboarding form and to send WAC a Vendor Questionnaire Form (SI Report, reference 11.11.24, 11.11.24.1, and 11.11.24.2).
- On 23 April 2025, WAC emailed VOGA to send through the fifty per cent invoice, completed vendor details questionnaire, and EFT form ahead of the 5 5 May meeting (SI Report, references 11.11.25, 11.11.25.1, 11.11.25.2, and 11.11.25.3).
- On 6 May 2025, VOGA met with WAC for an initial consultation meeting (SI Report, reference 11.11.26)
  - VOGA provided a presentation with background on Wandoo's operations and activities going forward. VOGA also outlined the next steps for consultation with WAC (SI Report, reference 11.11.26.1).
  - VOGA's presentation included:
    - An overview of VOGA's operations and an introduction of the meeting's attendees.
      - VOGA outlined the background of VOGA, its operations globally, and the location of the Wandoo field and shared images of the platform, including a history of the field. VOGA also explained the alternative production facilities in the field.
      - VOGA provided an overview of the project's EMBA and its development, as well as its impact on VOGA's consultation on the project's activities.
    - VOGA shared information on the surrounding marine environment and fauna at Wandoo , as well as the periodic marine monitoring it undertakes with UWA.
      - As part of the marine monitoring, VOGA shared a video and images of the marine fauna in the area around the field.
    - Following initial research undertaken by VOGA, VOGA determined that stingrays may be totemic species to Wanparta, and included a focused overview of Stingrays and other key marine fauna and their cultural sensitivities to the group, including a focused overview of stingrays in the area and advised that there are no expected impacts from VOGA's activities.
    - VOGA outlined its future plans for the Wandoo Field and provided an overview of the Exploration Drilling activities relating to this EP.
      - These activities included key information on the proposed Exploration Drilling activity, including timing, duration and potential risks.
      - Future plans for other EPS were discussed. However, these are not relevant to this EP.
  - During the presentation, VOGA engaged with WAC to answer any questions relating to the information shared. These questions included:
    - WAC asked a series of questions not directly relevant to this EP, including requesting information about VOGA's operations. This included where VOGA's staff are based, how long VOGA had been in operation, and why VOGA was only meeting with WAC now.
      - VOGA responded by outlining that its staff are sourced from all over the nation, as it is a fly-in, fly-out arrangement. VOGA also clarified the history of the Wandoo facility and acknowledged that, due to recent changes in First Nations approaches, it was reaching out to WAC.

- Following this, WAC agreed and recognised that the EMBA project falls within the Ngarla Native Title Area.

- WAC requested further information regarding oil, pipelines, cyclones, and the potential for environmental damage. These questions included discussions on:
  - If there had even been an oil spill at Wandoo.
    - VOGA confirmed that there has never been an oil spill.
  - The type of oil.
    - VOGA confirmed that it is heavy crude oil, the form of oil that is used in cars.
  - The risk of damage from cyclones, and VOGA's procedure during a cyclone.
    - VOGA explained that in the event of a category 1 or 2, staff stay on the facility but it is down-manned, and in the event of a category three or above, staff will be stood down and returned to shore. Operations will then be halted.
  - If VOGA had any issues with cyclones, particularly with regard to the integrity of pipelines.
    - VOGA outlined that several large cyclones have occurred during the facility's life, and that no significant damage has been caused to the production pipes. VOGA did note that a loading hose was damaged once in 2007, during a category five cyclone.
  - The regularity of pipeline inspections.
    - VOGA confirmed that the pipes at Wandoo are inspected every two years, and as a result of an inspection, the riser at Wandoo was replaced, which will last another 30 years. VOGA also confirmed that the pipeline to the calm buoy and the hoses are replaced every 10 years. Regular maintenance of the pressure lines is undertaken.
  - WAC also noted that it was the first time they had engaged with a company producing heavy oil and asked how VOGA would handle cleaning up a potential spill.
    - VOGA explained that spill response is a whole industry topic to manage, rather than individual companies. VOGA outlined that it has detailed spill plans, and outlined the role of organisations like AMOSC,
    - VOGA explained the key steps that are part of its detailed plans for how oil spills are dealt with. VOGA outlined that there are three key stages in this case. VOGA also outlined how actions can be taken to spray to break up and disperse the oil, then there is the next stage of containment of the spill, and finally, it would be dealt with at shore if it made it that far.
    - VOGA explained the work it has done with the EPA (previously CALM) for handling oiled wildlife, including:
      - Bought and imported containers from New Zealand following a spill incident there.
      - VOGA supplied them to the industry, as the local government lacked the capacity for this initiative.
      - VOGA noted that generally, the public is concerned about spills following the Montara oil spill incident in 2009.

- VOGA explained that there have been changes since the Montara incident, both in the regulatory landscape and by industry.
- Following this, WAC requested if the same procedures would be in place if there were a spill in the water column.
  - VOGA explained that if there were a small leak, it would be dispersed in the water column.
- WAC requested further information regarding how pipelines would remain undamaged in the event of a cyclone, and asked for clarification on de-pressuring the pipes, as well as how much oil remained in the pipe if de-pressured.
  - VOGA explained that pipes are de-pressurised in the event of a cyclone, and that there is a detailed process and procedure for preparing for a cyclone to prevent any damage or spill. VOGA also explained how de-pressurising pipes work and how they prevent any blowout situations.
- WAC requested further information on what happens in the event of a spill, and if VOGA can provide more details. They were also asked to give an example of the oil in a container.
- WAC also requested information regarding oiled wildlife, what VOGA uses for spraying oil in a spill, how long it would take for a major spill to get to the coast, and requested if Ngarla rangers could be involved if there is a need for a crude oil spill clean-up.
- WAC also requested that Ngarla and Wanparta be notified in the event of an oil spill.
  - VOGA confirmed that they would add Ngarla and Wanparta to the notification list in this EP.

- WAC also requested specific information regarding this EP, including details on potential noise impacts on migrating whales and the actions VOGA undertakes to avoid disrupting turtle and whale migrations.
  - VOGA explained that the noise level is lower with this form of survey compared to other surveys, and that VOGA would return to WAC with further information regarding turtle and whale migrations.
- During the meeting, WAC outlined its connection to the marine environment and fauna, and highlighted its connection to Stingrays as an animal totem, as well as sharks, octopus, fish and birds. WAC also explained that there are two to three islands within the native title area that host a songline for Ngarla, which extends all the way out to the island in the native title area, once accessible by foot.
  - VOGA thanked WAC for sharing this information.
- WAC also highlighted that a recent cyclone wiped out a bird species on the island, and asked what the impact might be to these areas in the event of a spill. VOGA responded, acknowledging the significance of particular species and the coastline to WAC.

- Following the presentation and discussion, a series of requests were made from WAC:
  - WAC would like VOGA to share results from its studies with UWA. VOGA confirmed it would send the information.
  - WAC requests that VOGA provide a soft copy of the exploration prospects map.
  - WAC requested it would like training on VOGA's type of crude oil.
  - WAC requested that Ngarla/Wanparta be notified if there is an event of an oil spill.
  - WAC requested VOGA to bring an oil sample in a jar to the next meeting.

- VOGA to provide more details on the question about activity timing and whale and turtle migration.
- WAC requested that VOGA share more information about the oiled wildlife containers mentioned at the meeting.
- WAC requested that VOGA bring an animation next time to show how the Wandoo production facility works.
- WAC requested that VOGA provide more information about its management procedures during cyclone events (specifically, pipeline integrity) and provide additional details about its spill response and containment practices.
- WAC requested that VOGA bring some merchandise (hats, etc) to the next meeting.

  - WAC also requested if VOGA would be available to meet in six months, and asked if VOGA would be open to coming to Port Hedland.

- On 23 May 2025, VOGA emailed WAC to thank them for the meeting, and to provide additional information regarding this EP and the requests and questions raised at the meeting (SI Report, reference 11.11.27).
  - VOGA included an attached meeting presentation, prospect map, and a series of research papers and studies undertaken with UWA at the project (SI Report, reference 11.11.27.1, 11.11.27.2, 11.11.27.3, 11.11.27.4, 11.11.27.5, 11.11.27.6, 11.11.27.7, and 11.11.27.8).
  - VOGA addressed a series of requests and actions following the meeting, including:
    - WAC's request to share results from the research studies with UWA. To which VOGA sent a series of research papers.
    - WAC's request to have a soft copy of the prospects map, to which VOGA attached the map in its reply.
    - WAC's request for training on the crude oil type.
      - VOGA responded by outlining that it would discuss an approach on training regarding the form of oil being produced and bring options to the next meeting with WAC.
    - WAC's request to be notified in the event of a spill.
      - VOGA noted WAC's request and noted the request's inclusion in this EP's notification table. VOGA requested if WAC could provide the details of who should be contacted.
    - WAC's request to receive an oil sample at the next meeting.
      - VOGA acknowledged the request, however noted the difficulty to transport the sample hydrocarbon via air transportation due to airline regulatory prohibitions. VOGA noted it would try to show a representative sample at the next meeting.
    - WAC's request to be provided with more detail to the question on activity timing and whale and turtle migration.
      - VOGA outlined its commitment to minimising environmental impacts and recognised the importance of avoiding sensitive periods for turtle nesting and whale migration. VOGA outlined the timing of the project activities was influenced by logistical and operational factors and the limitations may affect the ability to fully avoid the periods. VOGA also provided further details on the impacts and risk assessments that would be of interest to WAC including potential noise impacts and vessel collision risks with marine fauna.
      - VOGA clarified that due to the limited area of the operation and short duration of activities the likelihood of collisions with marine fauna was minimal, and clarified that VOGA was confident that existing measures can ensure the protection of marine fauna.

- WAC's request for further information on oiled wildlife containers.
  - VOGA outlined that it had updated the meeting presentation to include further information on the oil spill response, and clarified that VOGA's oil spill response advisor was available to attend future meetings.
- WAC's request for an animation of the facility to be shown at the next meeting.
  - VOGA noted the request and clarified that it does not have an animated version of the facility, but that it is happy to take further questions on how the facility works to help WAC improve their understanding of the operation.
- And WAC's request for VOGA to share its management programs regarding cyclones and information on spill response.
  - VOGA outlined that the meeting presentation had been updated to include information on its Cyclone Management Plan, and clarified that the platforms are shut down and fully demobilised on the approach of a cyclone greater than a Category 2.

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
WAC have not provided any feedback, objections or claims in relation to this activity in consultation to date in a face-to-face meeting and information provided via email. At the meeting WAC asked a question about VOGA's plans which VOGA has responded to.	VOGA has commenced consultation with WAC which resulted in a face-to-face meeting. VOGA seeks to arrange a follow up meeting with WAC and supports ongoing consultation with WAC on this and other Eps. Consultation is still ongoing with WAC.	VOGA continues consultation with WAC.	VOGA considers the measures and controls in the EP are sufficient.
During the meeting, WAC requested that VOGA share results from its studies with UWA.	VOGA noted WAC's request to share results from its studies with UWA.	VOGA confirmed it would share the results from its studies with UWA. VOGA has sent the UWA studies results to WAC.	VOGA considers the measures and controls in the EP to be sufficient.

During the meeting, WAC requested that VOGA provide a soft copy of the exploration prospects map.	VOGA noted WAC's request to provide a soft copy of the exploration prospects map.	VOGA confirmed it would provide a soft copy of the exploration prospects map and provided WAC with the soft copy of the map.	VOGA considers the measures and controls in the EP to be sufficient.
During the meeting, WAC requested training on VOGA's type of crude oil.	VOGA accepts WAC's request to receive training on VOGA's type of crude oil.	VOGA will continue to engage with WAC on this topic to respond to the request for training.	
During the meeting, WAC requested that Ngarla and Wanparta be notified in the event of an oil spill.	VOGA accepts WAC's request to be notified in the event of an oil spill.	VOGA confirmed it would notify WAC in the event of an oil spill	VOGA will notify WAC of any spill associated with this EP (Section 7, Table 7-2, CM-10.1) (Section 10, Table 10.4).
During the meeting, WAC requested more details on activity timing and in respect to migration times for whales and turtles.	VOGA accepts WAC's interest in this topic and noted the request for details on activity timing.	VOGA provided WAC details on activity timing and the migration of whales and turtles.	VOGA considers the measures and controls in the EP to be sufficient.
During the meeting, WAC requested further information on oiled wildlife containers that were mentioned at the meeting.	VOGA accepts WAC's request for further information on oiled wildlife containers that were mentioned at the meeting.	VOGA confirmed it would provide WAC further information on oiled wildlife containers that were mentioned at the meeting.	VOGA considers the measures and controls in the EP to be sufficient.

During the meeting, WAC requested that VOGA provide more information concerning its managed procedures during cyclone events, specifically around pipeline integrity, and provide additional details surrounding spill response and containment practices.	VOGA accepts WAC's request to provide more information concerning its managed procedures during cyclone events, specifically around pipeline integrity, and provide additional details surrounding spill response and containment practices.	VOGA responded to WAC's questions at the meeting, however confirmed it would provide more information to WAC concerning its managed procedures during cyclone events, specifically around pipeline integrity, and provide additional details surrounding spill response and containment practices. Following the meeting VOGA provided further details to WAC in the form of updated meeting presentation slides.	VOGA considers the measures and controls in the EP to be sufficient.
WAC have expressed support for consultation on this EP, which resulted in a face-to-face initial consultation meeting with WAC and the scheduling of a follow-up meeting.	VOGA accepts WAC's support for consultation, accompanying consultation meetings, and follow-up meetings.	VOGA has made contact with WAC via email and on the phone over an 8-month period and considers that a reasonable period of time has been provided. VOGA seeks to build a relationship and supports ongoing consultation with WAC on this and other EPs, as outlined in Section 10.4.1 of this EP.	VOGA considers the measures and controls in the EP are sufficient.
WAC have not provided any objections or claims in relation to this activity in consultation to date and information provided in December 2024 to which WAC confirmed receipt, and consultation presentation delivered in May 2025.	VOGA accepts that WAC may not have a comment at this time on the proposed activities under this EP.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with WAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with WAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided WAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to WAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the WAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to WAC over an eight-month period.
- VOGA has provided WAC with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.
- WAC has shown an understanding of the proposed activity during a meeting on 6 May 2025.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding WAC of the opportunity to provide feedback.
- VOGA asked for WAC's input into how WAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Wirrawandi Aboriginal Corporation RNTBC (WAC)
Consultation overview and summary of response on this EP

• On 9 October 2024, VOGA emailed WAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.4). VOGA advised it welcomes consultation with WAC regarding these activities.
  ○ VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
  ○ VOGA requested WAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
  ○ VOGA proposed a meeting to discuss the planned activities and provide information.
  ○ VOGA emphasised a co-design approach for the consultation process to ensure it meets WAC's needs.
  ○ VOGA also provided information on confidentiality and the option to opt out of the consultation.
• On 10 October 2024, WAC emailed VOGA to confirm that they were a relevant organisation for consultation (SI Report, reference 11.12.1).
  ○ The email requested a project EMBA map concerning the YM native title determination area and confirmed the possibility of meeting with VOGA following a board meeting in November 2024.
• On 6 November 2024, VOGA emailed WAC to confirm that an EMBA map would be provided by the end of the week and requested a date for the November board meeting (SI Report, reference 11.12.2).
• On 2 December 2024, WAC emailed VOGA to confirm that they could locate the project EMBA maps and that they were a relevant organisation to be consulted with (SI Report, reference 11.12.3).
  ○ WAC confirmed that no date was set for a December meeting that the capacity of WAC as a native title organisation was not the same as a non-native title organisation, and that an extended close-down period during December 2024 and January 2025 would apply.
  ○ The email also confirmed WAC's preference for formal consultation under a high-level agreement to confirm mutual expectations, meetings, information sharing and costs.
  ○ WAC provided updated contact details for further consultation.
  ○ The email included attachments of the relevant project EMBA.
• On 3 December 2024, VOGA emailed WAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.31 and 1.3).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
  ○ VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
  ○ VOGA believes WAC is relevant for consultation and invited them to participate in the process.
  ○ VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
  ○ VOGA requested formal consultation agreements before coordinating meetings.
  ○ VOGA provided information on confidentiality and the ability to opt out of the consultation.
  ○ VOGA attached two maps of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation,

reference 3.31.1, 3.31.2).

- On 6 December 2024, WAC emailed VOGA to inform them that the final board meeting for 2024 would be held the week of 16 December 2024. However, the email stipulated no date was confirmed and the agenda would be full (SI Report, reference 11.12.4).
    - The email stated that capacity for a meeting with VOGA may be available, but it would likely be towards the end of January 2025.
    - The email also included an attachment highlighting the fees for a meeting (SI Report, reference 11.12.4.1).
- On 9 December 2024, VOGA emailed WAC to confirm availability for the 16 December meeting (SI Report, reference 11.12.5).
- On 10 December 2024, VOGA called WAC to confirm the availability of the board meeting, to which WAC advised that the board meeting would be rescheduled as no board papers had been provided (SI Report, reference 11.12.6).
    - WAC also clarified that a new date would be provided shortly, and minor amendments to the framework agreement would be provided.
- On 16 December 2024, VOGA emailed WAC to confirm whether the 16 December meeting was available (SI Report, reference 11.12.7).
- On 16 January 2025, VOGA emailed WAC to thank them for the draft consultation framework and provided a new version with minor amendments. (SI Report, reference 11.12.8)
    - The email included a clean, signed version of the amended document (SI Report, reference 11.12.8.1).
- On 16 January 2025, WAC emailed VOGA confirming the receipt of the amended document and highlighted that it would likely be accepted by WAC due to its improvements without impact on substance. (SI Report, reference 11.12.9).
    - WAC also advised that meeting dates would be provided once confirmation was finalised from WAC.
- On 6 March 2025, VOGA called WAC, who advised that the group had their first board meeting the previous week, a 2-day meeting with a full agenda. (SI Report, reference 11.12.10).
    - The meeting did not complete its agenda.
    - WAC confirmed that the next meeting would likely be at the end of March and that they would confirm if the corporation’s acting CEO would be able to sign the funding agreement.
- On 31 March 2025, VOGA emailed WAC to follow up on the potential board meeting (SI Report, reference 11.12.11).
- On 9 May 2025, VOGA emailed WAC to follow up if they would like for VOGA to present at a board meeting (SI Report, reference 11.12.12).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
WAC has confirmed it is a relevant organisation for the purpose of consultation.	VOGA accepts WAC's confirmation as a relevant organisation.	VOGA has commenced consultation with WAC. Sufficient information to allow informed assessment has already been provided including a Summary and Consultation Information Sheets. VOGA has been in contact with WAC for a 5 month period and believes a reasonable period of time has been provided. VOGA will continue to progress a face-to-face engagement with WAC to continue consultation on this and other EPs	VOGA considers the measures and controls in the EP are sufficient.
WAC has expressed support for consultation on this EP and has indicated an opportunity to meet face-to-face with VOGA for consultation. A meeting has been advised for at the time of submission of this EP. WAC's preference is for consultation to be formalised under a high level agreement that confirms mutual expectations as to meetings, information sharing and costs.	VOGA accepts WAC's support for consultation.	VOGA has progressed a draft consultation framework agreement with WAC. VOGA seeks to build a relationship and supports ongoing consultation with WAC on this and other EPs as outlined in Section 10.4.1 of this EP.	VOGA will continue to progress the draft framework for consultation, and VOGA considers the measures and controls in the EP are sufficient at this time.

WAC has provided a draft framework for consultation and advised funding is required for its participation in consultation.			
WAC has not provided feedback, objections to date or claims in response to the information provided in December 2024 to which WAC confirmed receipt.	VOGA notes that WAC has yet to advise whether it has any objections at this time on the proposed activities under this EP.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	Although consultation for the purpose of Regulation 25 of the OPGGS(E)R is complete, VOGA will continue to engage with WAC as part of ongoing consultation (see Section 10.4.1 of this EP) and as requirement by the implementation strategy as set out in Regulation 22(15) of the OPGGS(E)R.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with WAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided WAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to WAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the WAC native title determination.
- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable period

- VOGA has addressed and responded to WAC over an eight-month period.
- VOGA has provided WAC with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding WAC of the opportunity to provide feedback.
- VOGA asked for WAC's input into how WAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Yawuru Native Title Holders Aboriginal Corporation RNTBC (Yawuru)

Consultation overview and summary of response on this EP

- On 14 October 2024, VOGA called Yawuru to explain the upcoming consultation. VOGA was forwarded to the relevant representative, who was unavailable at the time, and provided with the representatives email (SI Report, reference 11.13.1).
- On 17 October 2024, VOGA emailed Yawuru to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.13). VOGA advised it welcomes consultation with Yawuru regarding these activities.
    - VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
    - VOGA requested Yawuru's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
    - VOGA proposed a meeting to discuss the planned activities and provide information.
    - VOGA emphasised a co-design approach for the consultation process to ensure it meets Yawuru's needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 3 December 2024, VOGA emailed Yawuru advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.32 and 1.3).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their

environmental planning.
    - VOGA believes Yawuru is relevant for consultation and invited them to participate in the process.
    - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.
    - VOGA requested formal consultation agreements before coordinating meetings.
    - VOGA provided information on confidentiality and the ability to opt out of the consultation.
    - VOGA attached a map of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.32.1).
- On 10 December 2024, VOGA called Yawuru and spoke to the group's reception. VOGA left a message for the group's representative (SI Report, reference 11.13.2).
- On 20 January 2025, VOGA called Yawuru and spoke to the group's reception. VOGA left a message for the group's representative (SI Report, reference 11.13.3).
- On 20 January 2025, VOGA emailed Yawuru to follow up with the previous consultation and to request a time to discuss the contents of the previous outreach (SI Report, reference 11.13.4).
- On 20 January 2025, Yawuru emailed VOGA to include their future acts and heritage coordinator for further consultation (SI Report, reference 11.13.5).
- On 14 February 2025, VOGA emailed Yawuru to follow up and to request a time to discuss the consultation (SI Report, reference 11.13.6).
- On 21 February 2025, VOGA called Yawuru and was informed that the future acts and heritage coordinator had been relocated. VOGA left a message for a return call (SI Report, reference 11.13.7).
- On 21 February 2025, VOGA emailed Yawuru to follow up on the previous consultation and to confirm the message left previously (SI Report, reference 11.13.8).
- On 6 March 2025, VOGA called Yawuru. Yawuru advised that the representative was in a meeting. VOGA requested to be called back (SI report, reference 11.13.9).
- On 6 March 2025, VOGA emailed Yawuru to advise of the message and request a follow-up call or an alternative contact person if appropriate (SI Report, reference 11.13.10).
- On 7 March 2025, Yawuru called VOGA, and outlined that due to the size of the EMBA, it was unlikely to impact Yawuru. The representative also advised that Yawuru only holds a couple board meetings each year, and there is a request for limited consultation from Yawuru. Yawuru also advised that they do not need to be engaged further on this consultation. VOGA requested this information be provided in an email (SI Report, reference 11.13.11).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
Yawuru confirmed that it does not need to be consulted due to the size of the EMBA likely having no impact on Yawuru.	VOGA notes that Yawuru has advised that the project is unlikely to impact Yawuru, and that they need not be engaged further on this consultation.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA considers the measures and controls in the EP to be appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Yawuru for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided Yawuru on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to Yawuru on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the Yawuru native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to Yawuru over an eight-month period.
- VOGA has provided Yawuru with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding Yawuru of the opportunity to provide feedback.
- VOGA asked for Yawuru's input into how Yawuru would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Yindjibarndi Aboriginal Corporation (YAC)

Consultation overview and summary of response on this EP

- On 14 October 2024, VOGA emailed YAC to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.9). VOGA advised it welcomes consultation with YAC regarding these activities.
    - VOGA outlined the purpose of consultation and that it values the integration of cultural heritage of Native Title Holders and aims to integrate these values into their planning.
    - VOGA requested YAC's advice on preferred contact and consultation methods and if a formal consultation agreement is needed.
    - VOGA proposed a meeting to discuss the planned activities and provide information.
    - VOGA emphasised a co-design approach for the consultation process to ensure it meets YAC's needs.
    - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 3 December 2024, VOGA emailed YAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.33 and 1.3).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
    - VOGA believes YAC is relevant for consultation and invited them to participate in the process.
    - VOGA proposed a meeting in February 2025 to discuss the proposed activities, seek input, and engage in consultation.

- VOGA requested formal consultation agreements before coordinating meetings.
- VOGA provided information on confidentiality and the ability to opt out of the consultation.
- VOGA attached two maps of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.33.1, 3.33.2).

- On 5 December 2024, VOGA called YAC. The call was unanswered, and a message was left (SI Report, reference 11.14.1).
- On 20 January 2025, VOGA called YAC, who provided the correct contact details for consultation discussions (SI Report, reference 11.14.2).
- On 20 January 2025, VOGA called YAC and provided an introduction to consultation activities, referring to previous emails sent (SI Report, reference 11.14.3).
  - In the discussion, YAC advised that it has no interest in offshore oil and that Ngarluma manages all interests.
  - YAC requested that VOGA send the consultation information so that YAC could advise that consultation is not required.
- On 20 January 2025, VOGA emailed YAC to thank them for an earlier phone call and requested confirmation that YAC would not need to be consulted regarding offshore oil operations and that YAC defer the consultation to Ngarluma (SI Report, reference 11.14.4).
  - The email also requested that YAC provide the name of an additional traditional owner who should be consulted and contact details.

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
YAC advised that it has no interest in offshore oil and that Ngarluma manages all interest.	VOGA acknowledged that YAC has no interest in offshore oil and defers VOGA's consultation on this EP to the Ngarluma.	VOGA notes that YAC has advised it has no comment at this time on the proposed activities under this EP.	VOGA considers the measures and controls in the EP to be appropriate. No additional measures or controls are required.

YAC has advised that VOGA should consult with an additional traditional owner.	VOGA accepts YAC's recommendation to consult with an additional group.	VOGA has initiated consultation with the Ngarluma Aboriginal Corporation for consultation on this EP. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA has initiated the consultation as advised by YAC.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with YAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided YAC on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to YAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the YAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to YAC over three months.
- VOGA has provided YAC with more than eight months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding YAC of the opportunity to provide feedback.
- VOGA asked for YAC's input into how YAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Murujuga Aboriginal Corporation (MAC)

Consultation overview and summary of response on this EP

- On 21 February 2025, VOGA emailed MAC advising of proposed activities in the Wandoo Field. VOGA provided a Summary Information Sheet and a link to a Consultation Information Sheet on its website (Record of Consultation, reference 3.38 and 1.3).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - VOGA advised it recognised the importance of cultural heritage to Native Title Holders and was committed to integrating these values into their environmental planning.
    - VOGA believes MAC is relevant for consultation and invited them to participate in the process.
    - VOGA proposed a meeting in March 2025 to discuss the proposed activities, seek input, and engage in consultation.
    - VOGA requested formal consultation agreements before coordinating meetings.
    - VOGA provided information on confidentiality and the ability to opt out of the consultation.
    - VOGA attached two maps of the native title determination in respect to location of operations and EMBA for this EP (Record of Consultation, reference 3.38.1, 3.38.2).
- On 13 March 2025, VOGA emailed MAC to follow up on the previous consultation and requested that MAC call VOGA to pursue the consultation (SI Report, reference 11.15.1).
- On 1 April 2025, VOGA emailed MAC to request a call and follow up on previous consultation (SI Report, reference 11.15.2).
- On 1 April 2025, VOGA entered an online enquiry to MAC through their website, requesting to be contacted regarding this EP (SI Report, reference 11.15.3).
- On 23 May 2025, VOGA called MAC, the call went unanswered and a message was left requesting a response (SI Report, reference 11.15.4).
- On 23 May 2025, VOGA emailed MAC to confirm the call and to request a call or an email back to discuss further consultation (SI Report, reference 11.15.5).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP). MAC is yet to advise if MAC is relevant to consultation for this EP.	During a consultation call, it was recommended that MAC might be a relevant person for consultation on VOGA's EPs. VOGA has contacted and followed up with MAC for consultation on this EP and another EP. VOGA acknowledged that MAC has been afforded a shorter period to participate in consultation for this EP. VOGA will continue to attempt contact with MAC. VOGA will continue to progress relationship building with MAC and offer a face-to-face engagement with MAC to engage in consultation on this and other EPs, as outlined in Section 10.4.1 of this EP. VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA considers the measures and controls in the EP are sufficient. Although consultation for the purpose of regulation 25 of the Environment Regulations is complete, VOGA will continue to engage with MAC as part of ongoing consultation (see Section 10.4.1 of this EP).

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with MAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided MAC on 21 February 2025 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- A Summary Consultation Information Sheet, developed specifically for First Nations groups, was provided to MAC on 3 December 2024.
- Maps were provided showing the location and EMBA in relation to the MAC native title determination.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to MAC over a eight-month period.
- VOGA has provided MAC with more than four months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding MAC of the opportunity to provide feedback.
- VOGA asked for MAC's input into how MAC would like to engage in consultation and has consulted in a way it understands is appropriate for First Nations groups.

Native Title representative bodies			
Kimberley Land Council (KLC)			
Consultation overview and summary of response on this EP			

• From 7 October 2024, VOGA has been in two way correspondence with NKAC as a conduit for consultation with NTGAC on this EP (SI Report, reference 11.9).
• On 15 March 2025, VOGA emailed KLC advising of proposed activities in the Wandoo Field. VOGA provided a map of the title area, information on the wandoo operations and information on the consultation activities (SI Report, reference 12.1.1).
  ○ VOGA sought to confirm the necessity of consultation with KLC and whether KLC considered itself a relevant person for the purpose of providing feedback or input to the environmental planning process, particularly relating to cultural features of the environment.
  ○ VOGA clarified that KLC had been engaged as a conduit and contact point with relevant PBCs in VOGA's consultation to date and cited NKAC as a group that VOGA had been consulting with where KLC had also been engaged.
  ○ VOGA stated its assumption that it considers KLC may not consider it appropriate to represent the views of groups and organisations that use their services. However, in some circumstances, KLC may act as a conduit or formal contact point for PBCs and may provide advice on groups that could be relevant for consultation and to gather insights about preferred consultation approaches.
  ○ VOGA sought advice, confirmation or guidance on this matter from KLC.
• On 1 April 2025, VOGA emailed KLC to follow up on the previous consultation and request a time to discuss (SI Report, reference 12.1.2).
• On 13 May 2025, VOGA called KLC and left a message requesting a return call (SI Report, reference 12.1.3).
• On 13 May 2025, VOGA emailed KLC to confirm the receipt of call and to request a return call (SI Report, reference 12.1.4).			

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP. Since the engagement began in October 2024, KLC has not self-identified for consultation on this EP. KLC has not provided feedback, objections or clams in response to the information provided in December 2024.	VOGA understands that KLC provides legal and administration services to PBCs in its capacity as a NTRB. As such, KLC may or may not be relevant for consultation.	VOGA has sought advice, confirmation or guidance from KLC on whether it is a relevant person for consultation on this EP. VOGA will continue to engage with KLC on this matter and as part of ongoing consultation (see Section 10.4.1 of this EP). VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be	VOGA considers the measures and controls in the EP address KLC's functions, interests or activities.

		received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with KLC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided KLC on 15 March 2025 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- Maps were provided showing the location and title area of the project.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to KLC over two months.
- VOGA has provided KLC with more than two months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.
- VOGA has corresponded with KLC on behalf of NKAC for over eight months and has maintained regular communication with KLC as a conduit for discussions with NKAC.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding KLC of the opportunity to provide feedback.

- VOGA asked for KLC's input on how KLC would like to engage in consultation and has consulted in a way it understands is appropriate for Native Title representative bodies.

Yamatji Marlpa Aboriginal Corporation (YMAC)

Consultation overview and summary of response on this EP

- From 2 October 2024, VOGA has been in two-way correspondence with YMAC as a conduit for consultation with NTGAC on this EP (SI Report, reference 11.6).
    - This resulted in a face-to-face meeting, which a representative from YMAC attended on 17 February 2025 (SI Report, reference 11.6.19).
- From 17 October 2024, VOGA has been in two-way correspondence with YMAC as a conduit for consultation with NWAC on this EP (SI Report, reference 11.10).
- On 10 February 2025, VOGA attended YMAC's offices in Perth for a consultation meeting with NWAC. Four representatives from YMAC attended the meeting. At the meeting, YMAC engaged with VOGA's presentation by asking questions about the operations. YMAC shared recommended contacts for VOGA to reach out to for consultation on another EP (SI Report, reference 11.10.13).
- From 21 January 2025, VOGA has been in correspondence with YMAC as a conduit for consultation with YAC due to YAC's relationship with NTGAC (SI Report, reference 11.7.1).
- On 15 March 2025, VOGA emailed YMAC advising of proposed activities in the Wandoo Field. VOGA provided a map of the title area, information on the wandoo operations and information on the consultation activities (SI Report, reference 12.2.1).
    - VOGA sought to confirm the necessity of consultation with YMAC and whether YMAC considered itself a relevant person for the purpose of providing feedback or input to the environmental planning process, particularly relating to cultural features of the environment.
    - VOGA clarified that YMAC had been engaged as a conduit and contact point with relevant PBCs in VOGA's consultation to date and cited three groups that VOGA had been consulting with where YMAC had also been engaged.
    - VOGA stated its assumption that it considers YMAC may not consider it appropriate to represent the views of groups and organisations that use their services. However, in some circumstances, YMAC may act as a conduit or formal contact point for PBCs and may provide advice on groups that could be relevant for consultation and to gather insights about preferred consultation approaches.
    - VOGA sought advice, confirmation or guidance on this matter from YMAC.
- On 1 April 2025, VOGA emailed YMAC to follow up on previous consultation, and to confirm if the matter should be directed to someone else at YMAC (SI Report, reference 12.2.2).
- On 13 May 2025, VOGA called YMAC and left a message with YMAC's reception requesting a return call (SI Report, reference 12.2.3).

- On 13 May 2025, VOGA emailed YMAC to follow up on the missed call, and to request a follow-up call (SI Report, reference 12.2.4).
- On 13 May 2025, YMAC emailed VOGA to confirm that they had forwarded the consultation information to the correct representative within YMAC and had included the representative in the email (SI Report, reference 12.2.5).
- On 13 May 2025, VOGA emailed YMAC to thank them for the update and to request a call with the correct representative (SI Report, reference 12.2.6).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP. Since the engagement began in October 2024, YMAC has not self-identified for consultation on this EP. YMAC has not provided feedback, objections or clams in response to the information provided in December 2024.	VOGA understands that YMAC provides legal and administration services to PBCs in its capacity as a NTRB. As such, YMAC may or may not be relevant for consultation.	VOGA has sought advice, confirmation or guidance from YMAC on whether it is a relevant person for consultation on this EP. VOGA will continue to engage with YMAC on this matter and as part of ongoing consultation (see Section 10.4.1 of this EP). VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA considers the measures and controls in the EP address YMAC's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with YMAC for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided YMAC on 15 March 2025 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.
- Maps were provided showing the location and title area of the project.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.
- VOGA has addressed and responded to YMAC over two months.
- VOGA has provided YMAC with more than two months to consult ahead of preparing the EP for submission and continues to take feedback in relation to the EP.
- VOGA has corresponded with YMAC on behalf of NWAC, NTGAC, and YAC for over eight months and has maintained regular communication with YMAC as a conduit for discussions with NWAC, NTGAC, and YAC.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA has sent follow-up consultation emails and phone calls, reminding KLC of the opportunity to provide feedback.
- VOGA asked for YMAC's input into how YMAC would like to engage in consultation and has consulted in a way it understands is appropriate for Native Title Representative Groups.

Historical heritage groups or organisations
Western Australian Museum (WAM)
Consultation overview and summary of response on this EP

• On 3 December 2024, VOGA emailed WAM advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.17 and 1.1).
  ○ The email included an activity summary, VOGA's assessment of historical shipwrecks, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation and advised that VOGA had contacted the Department of Planning, Lands and Heritage (DPLH) for consultation.
  ○ The email also included VOGA's assessment of historic shipwrecks, including:
  ▪ An analysis from VOGA that no historical wrecks are present within the Operational Area or within a 100km buffer of the EMBA.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
• On 13 January 2025, VOGA emailed WAM following up on the proposed activity and provided VOGA's assessment of underwater cultural heritage, and a Consultation Information Sheet (Record of Consultation, reference 4.9 and 1.1)
  ○ The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
  ○ The email also provided VOGA's assessment of underwater heritage as supplied on 3 December 2024
  ○ VOGA also advised that it had contacted the DPLH as part of consultation activities.
• On 15 May 2025, VOGA emailed WAM to clarify known historical shipwrecks in the project EMBA (SI Report, reference 13.1.1).
  ○ VOGA corrected the previous statement that there were 31 historical wrecks within 100km of the EMBA, by providing the updated figure of 38 shipwrecks and shipwreck artifacts within the EMBA.
  ○ VOGA also clarified that there are no shipwrecks or artifacts located within the Operational Area, and clarified the nearest shipwreck.
  ○ VOGA also provided a table in the email, sourced from this EP, which outlines all the historical wrecks within the project EMBA. (SI Report, reference 13.1.1.1)
  ○ The email also clarified that DPLH and DCCEEW had been contacted regarding the updated figures.
  ○ VOGA also requested any feedback on the shipwreck information.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that WAM has no comment at this time.	VOGA considers the measures and controls in the EP address WAM's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with WAM for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to WAM on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding WAM of the opportunity to provide feedback.

Local government and recognised local business and community reference/liaison groups or organisations
City of Karratha
Consultation overview and summary of response on this EP

• On 3 December 2024, VOGA emailed City of Karratha advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.19 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
• On 12 December 2024, City of Karratha emailed VOGA confirming the receipt of the consultation and provided feedback with regard to this EP (SI Report, reference 14.1.1
  ○ City of Karratha recommended that a spotter be included to monitor for marine fauna in the area and to suspend noise-emitting activities until the fauna has moved past the work area.
  ○ City of Karratha also advised that due to the activity being located within a known cetacean migration route, the approach aligns with common practices used by oil and gas companies during exploration and maintenance campaigns to mitigate disturbance and impacts.
• On 18 December 2024, VOGA emailed City of Karratha to thank them for their response and feedback on this EP (SI Report, reference 14.1.2)
  ○ VOGA acknowledged the recommendation to include a spotter to monitor for marine fauna.
  ○ VOGA also provided additional information regarding this EP, including:
  ▪ Information regarding Vertical Seismic Profiling (VSP), including the details of VSP, total sound source volume, and the duration of VSP.
  ▪ VOGA provided details on VSP compared to conventional seismic survey arrays and the controls in place to minimise the effect on marine fauna.
  ▪ VOGA also provided a list of measures and controls as sources from Part A of EPBC Policy Statement 2.1, including measures:
  • A.3.1: Pre Start-Up Visual Observations
  • A.3.4: Operations Procedure
  • A.3.6.: Night-time and Low Visibility Procedure
  ▪ VOGA confirmed that these measures should mitigate any potential impacts on marine fauna to as low as reasonably practical or to an acceptable level.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
The City of Karratha recommended that a spotter be included to monitor fauna in the area and suspend noise-emitting activities until the fauna moved past the work area.	VOGA noted City of Karratha's recommendation for a spotter to be hired to monitor fauna and to suspend activities while fauna is in the area.	VOGA acknowledged the request and responded to the recommended controls with regard to seismic survey arrays and VSP's to mitigate impact to marine fauna.	VOGA considers the measures and controls in the EP are appropriate. (Section 7, Table 7-2, CM-5.3)
City of Karratha recommended that VOGA adopt common practices used by oil and gas companies during exploration to mitigate the disturbance and impacts to Cetaceans. Whilst feedback has been received, there were no objections or claims.	VOGA accepted City of Karratha's recommendation to adopt common practices.	VOGA outlined the measures and controls adopted from Part A of EPBC's policy statement 2.1. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with City of Karratha for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to City of Karratha on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.

Town of Port Hedland

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Town of Port Hedland advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.19 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Town of Port Hedland following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.13 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Town of Port Hedland has no comment at this time.	VOGA considers the measures and controls in the EP address Town of Port Hedland's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Town of Port Hedland for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Town of Port Hedland on 3 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Town of Port Hedland of the opportunity to provide feedback.

Shire of Ashburton
Consultation overview and summary of response on this EP

• On 3 December 2024, VOGA emailed Shire of Ashburton advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.19 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
• On 13 January 2025, VOGA emailed Shire of Ashburton following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.13 and 1.1).
  ○ The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
• On 14 January 2025, Shire of Ashburton emailed VOGA, providing an attached response to the consultation (SI Report, reference 14.2.1, 14.2.1.1).
  ○ The attached document included feedback from the Shire regarding:
  ▪ Environmental management and risks, including maintaining rigorous environmental management systems that meet or exceed regulatory standards and industry best practices, and aligning survey activities to avoid overlapping with key marine fauna cycles.
  ▪ Emergency management and preparedness tasks, including engaging the Shire's Local and District Emergency Management Committees and ensuring coordination with the relevant management authorities. The document also outlined that these tasks should be communicated with potentially affected community members.
  ▪ In the event of decommissioning (not relevant to this EP), VOGA should consider the Shire-operated Pilbara Regional Waste Management Facility (PRWMF) for its decommissioning and waste, align waste strategies with the principles of the waste hierarchy, and comply with relevant regulations.
  ▪ The Shire highlighted ongoing consultation and reporting measures, and requested regular updates on the outcomes of environmental monitoring programs, updates on scheduling and adjustments to mitigate impacts and summaries of any community or stakeholder engagement.
• On 14 February 2025, VOGA emailed the Shire of Ashburton to thank them for responding to the consultation and noted their feedback and comments regarding environmental management and risks (SI Report, reference 14.2.2).
  ○ VOGA confirmed the health, safety and environment management systems, and that VOGA would implement control measures that meet or exceed regulatory standards and industry best practices to minimise risks to sensitive marine and coastal ecosystems to as low as reasonably practicable.
  ○ VOGA also confirmed that its HSE MS plans had been developed in accordance with the following standards:
  ▪ ISO 14001: Environmental Management System

- OHSAS 18002:2000 Occupational Health & Safety Management Systems (an international standard equivalent to AS/NZS 4801), and
- API 9100 Model Environmental, Health and Safety Management System.

- VOGA also noted the concerns regarding avoiding marine fauna cycles and confirmed that VOGA understands the importance of aligning survey activities to avoid overlapping with key fauna cycles. VOGA also confirmed that it believes existing mitigation and management controls in place are sufficient to reduce any potential impacts on marine fauna.
  - VOGA requested the Shire of Ashburton's guidance if any additional information regarding potential impacts and mitigation and management measures would be required.
- The email also outlined VOGA's plans in the event of an unplanned event, including the Emergency Management Plan, and further consultation with the Shire of Ashburton's emergency management committees and that VOGA would regularly liaise with regulators and government agencies.
- The email outlined ongoing consultation and reporting and stated that VOGA has undertaken a broad assessment and consultation with community members. VOGA confirmed that all consultation activities had been developed in accordance with relevant regulations and that VOGA would provide regular updates on the progress of activities and summaries of community and stakeholder engagements to be published in this EP and submitted to NOPSEMA.

- On 14 February 2025, Shire of Ashburton emailed VOGA in the form of an automatic reply to confirm the receipt of email (SI Report, reference 14.2.3).

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
The Shire of Ashburton provided feedback and comments regarding environmental management and risk and urged VOGA to maintain rigorous environment management that meet or exceed regulatory standards and industry best practice.	VOGA notes the Shires feedback and advice on environmental management and risk.	VOGA responded to the Shire and: • confirmed it maintains rigorous health, safety and management systems; and • VOGA implements control measures that meet or exceed regulatory standards and best practice; • to minimise risks to sensitive marine and coastal ecosystems to ALARP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

		• VOGA provided the current standards for developing HSE MS plans. VOGA's Health, Safety and Environment (HSE) Policy is at Appendix A of this EP.	
The Shire of Ashburton requested that VOGA align survey activities to avoid overlapping with key marine fauna cycles, including turtle nesting and whale migrations.	VOGA noted and responded to the request to align survey activities to avoid overlapping with key fauna cycles.	VOGA provided background on measures in place to protect marine fauna cycles and responded to the Shire's feedback by advising: • VOGA understands the importance of aligning survey activities to avoid overlapping with key marine fauna cycles. • VOGA's activities are highly dependent on availability of vessels and equipment • VOGA believes its existing mitigation management controls in place are sufficient to reduce the impacts on marine fauna. • VOGA offered to provide more information if the Shire required it.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

The Shire of Ashburton commented on Emergency Management and Preparedness and requested VOGA engage with the Shire's Local and District Emergency Management Committees	VOGA noted the request for consultation with the Shire's committees.	VOGA noted and responded to the request for engagement and requested the relevant contact information.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
The Shire of Ashburton commented on Emergency Management and Preparedness and requested if VOGA can ensure Coordination has been established with relevant National, State, and Local emergency management agencies	VOGA noted the Shire's questions regarding emergency management and preparedness.	VOGA noted and responded that it regularly liaises with relevant regulators and agencies.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.
The Shire of Ashburton requested information regarding waste management and decommissioning.	VOGA accepts the Shire's request for information regarding waste management and decommissioning, although decommissioning is not relevant to this EP.	VOGA provided background on the waste management plans for this EP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

The Shire of Ashburton requested VOGA provide regular updates on the progress of the proposed activities including: • Outcomes of environmental monitoring programs • Scheduling updates and adjustments to mitigate environmental or social impacts • Summaries of any community or stakeholder engagements conducted as part of the project	VOGA accepts the Shire's requests regarding updates on the progress on proposed activities relating to environmental monitoring, scheduling updates and community engagement.	Regarding ongoing consultation and updates: • VOGA confirmed that all consultation activities have been developed in accordance with relevant regulations and community members were advised through multiple channels. • VOGA will provide regular updates on the progress of activities and environmental monitoring programs • Summaries of consultation and engagement are published in the EPs and made available on the NOPSEMA website.	VOGA will notify the Shire of Ashburton regarding the progress of activities and environmental monitoring programs.
While feedback has been received, there were no objections or claims on this EP.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA notes that the Shire of Ashburton has provided feedback to this EP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation Shire of Ashburton for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Shire of Ashburton on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Shire of Ashburton of the opportunity to provide feedback.

Shire of Exmouth

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Shire of Exmouth advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.19 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Shire of Exmouth following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.13 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Shire of Exmouth has no comment at this time.	VOGA considers the measures and controls in the EP address Shire of Exmouth's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Shire of Exmouth for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Shire of Exmouth on 3 December 2024 based on their function, interest and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Shire of Exmouth of the opportunity to provide feedback.

Shire of Carnarvon

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Shire of Carnarvon advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.21 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Shire of Carnarvon following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.19 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Shire of Carnarvon has no comment at this time.	VOGA considers the measures and controls in the EP address Shire of Carnarvon's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Shire of Carnarvon for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Shire of Carnarvon on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Shire of Carnarvon of the opportunity to provide feedback.

Shire of East Pilbara

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Shire of East Pilbara advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.21 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Shire of East Pilbara following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.19 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Shire of East Pilbara has no comment at this time.	VOGA considers the measures and controls in the EP address Shire of East Pilbara's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Shire of East Pilbara for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Shire of East Pilbara on 3 December 2024 based on their function, interest and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Shire of East Pilbara of the opportunity to provide feedback.

Shire of Broome

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Shire of Broome advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.21 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Shire of Broome following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.19 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
- On 24 January 2025, Shire of Broome emailed VOGA to confirm that due to the location and distance of the project, the Shire of Broome has no comment (SI Report, reference 14.3.1).
- On 14 February 2025, VOGA emailed Shire of Broome to thank them for their response and advice (SI Report, reference 14.3.2).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted

Shire of Broome reported it had no concerns with the activities associated with the EP due to the activities distance from the Shire. Whilst feedback has been received, there were no objections or claims.	VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA notes Shire of Broome has advised it has no comments on the proposed activities under this EP.	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation Shire of Broome for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Shire of Broome on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Shire of Broome of the opportunity to provide feedback.

Shire of Shark Bay

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Shire of Shark Bay advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.21 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Shire of Shark Bay following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.19 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Shire of Shark Bay has no comment at this time.	VOGA considers the measures and controls in the EP address Shire of Shark Bay's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Shire of Shark Bay for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Shire of Shark Bay on 3 December 2024 based on their function, interest and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Shire of Shark Bay of the opportunity to provide feedback.

Shire of Northampton

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Shire of Northampton advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.21 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Shire of Northampton following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.19 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Shire of Northampton has no comment at this time.	VOGA considers the measures and controls in the EP address Shire of Northampton's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Shire of Northampton for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Shire of Northampton on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Shire of Northampton of the opportunity to provide feedback.

Regional Development Australia (Pilbara) Karratha WA			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Regional Development Australia (Pilbara) Karratha WA advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.19 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Regional Development Australia (Pilbara) Karratha WA following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.13 and 1.1.) o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Regional Development Australia (Pilbara) Karratha WA has no comment at this time.	VOGA considers the measures and controls in the EP address Regional Development Australia (Pilbara) Karratha WA's functions, interests or activities.
Consultation demonstration statement			
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Regional Development Australia (Pilbara) Karratha WA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:			

Sufficient Information

- Consultation information provided to Regional Development Australia (Pilbara) Karratha WA on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Regional Development Australia (Pilbara) Karratha WA of the opportunity to provide feedback.

Port Hedland Chamber of Commerce and Industry

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed Port Hedland Chamber of Commerce and Industry advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.19 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Port Hedland Chamber of Commerce and Industry following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.13 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Port Hedland Chamber of Commerce and Industry has no comment at this time.	VOGA considers the measures and controls in the EP address Port Hedland Chamber of Commerce and Industry's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Port Hedland Chamber of Commerce and Industry for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Port Hedland Chamber of Commerce and Industry on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Port Hedland Chamber of Commerce and Industry of the opportunity to provide feedback.

Broome Chamber of Commerce and Industry			
Consultation overview and summary of response on this EP			
• On 3 December 2024, VOGA emailed Broome Chamber of Commerce and Industry advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.21 and 1.1). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. • On 13 January 2025, VOGA emailed Broome Chamber of Commerce and Industry following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.19 and 1.1). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Broome Chamber of Commerce and Industry has no comment at this time.	VOGA considers the measures and controls in the EP address Broome Chamber of Commerce and Industry's functions, interests or activities.
Consultation demonstration statement			
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Broome Chamber of Commerce and Industry for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Broome Chamber of Commerce and Industry on 3 December 2024 based on their function, interest and activities.			

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Broome Chamber of Commerce and Industry of the opportunity to provide feedback.

Onslow Chamber of Commerce and Industry

Consultation overview and summary of response on this EP

- On 18 December 2024, VOGA emailed Onslow Chamber of Commerce and Industry advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.36 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Onslow Chamber of Commerce and Industry following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.14 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Onslow Chamber of Commerce and Industry has no comment at this time.	VOGA considers the measures and controls in the EP address Onslow Chamber of Commerce and Industry's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Onslow Chamber of Commerce and Industry for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Onslow Chamber of Commerce and Industry on 18 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Onslow Chamber of Commerce and Industry of the opportunity to provide feedback.

Western Australian Local Government Association (WALGA)

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed WALGA advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.19 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed WALGA following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.13 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that WALGA has no comment at this time.	VOGA considers the measures and controls in the EP address WALGA's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with WALGA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to WALGA on 3 December 2024 based on their function, interest and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding WALGA of the opportunity to provide feedback.

Karratha and Districts Chamber of Commerce and Industry (KDCCI)

Consultation overview and summary of response on this EP

- On 3 December 2024, VOGA emailed KDCCI advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.19 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
- On 13 January 2025, VOGA emailed KDCCI following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.13 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that KDCCI has no comment at this time.	VOGA considers the measures and controls in the EP address KDCCI's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with KDCCI for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to KDCCI on 3 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding KDCCI of the opportunity to provide feedback.

Research institutes			
Curtin University (Centre for Marine Science and Technology)			
Consultation overview and summary of response on this EP			

• On 2 December 2024, VOGA emailed Curtin University advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.12 and 1.1).
  ○ The email included an activity summary, a request for current research activities, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  ○ VOGA also sought advice on any research activities being undertaken that could intersect with the proposed activities under the EP.
• On 13 January 2025, VOGA emailed Curtin University following up on the proposed activity and a Consultation Information Sheet (Record of Consultation, reference 4.15 and 1.1)
  ○ The email included an activity summary, a request for current research activities, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
  ○ VOGA also reiterated the request for advice on any research activities being undertaken that could intersect with the proposed activities under the EP.			

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Curtin University has no comment at this time.	VOGA considers the measures and controls in the EP address Curtin University's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Curtin University for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to Curtin University on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding Curtin University of the opportunity to provide feedback.
University of Western Australia (UWA)
Consultation overview and summary of response on this EP

• On 2 December 2024, VOGA emailed UWA advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.12 and 1.1).
  ○ The email included an activity summary, a request for current research activities, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  ○ VOGA also sought advice on any research activities being undertaken that could intersect with the proposed activities under the EP.
• On 13 January 2025, VOGA emailed UWA following up on the proposed activity and a Consultation Information Sheet (Record of Consultation, reference 4.15 and 1.1)

- The email included an activity summary, a request for current research activities, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
- VOGA also reiterated the request for advice on any research activities being undertaken that could intersect with the proposed activities under the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that UWA has no comment at this time.	VOGA considers the measures and controls in the EP address UWA's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with UWA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to UWA on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.

- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding UWA of the opportunity to provide feedback.

Commonwealth Scientific and Industrial Research Organisation (CSIRO)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA emailed CSIRO advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.12 and 1.1).
    - The email included an activity summary, a request for current research activities, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - VOGA also sought advice on any research activities being undertaken that could intersect with the proposed activities under the EP.
- On 3 December 2024, CSIRO emailed VOGA to confirm the receipt of consultation information, and informed VOGA that the outreach had been forwarded to the Environment Partnerships and Business Development area (SI Report, reference 15.1.1)
- On 13 January 2025, VOGA emailed CSIRO following up on the proposed activity and a Consultation Information Sheet (Record of Consultation, reference 4.15 and 1.1)
    - The email included an activity summary, a request for current research activities, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
    - VOGA also reiterated the request for advice on any research activities being undertaken that could intersect with the proposed activities under the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that CSIRO has no comment at this time.	VOGA considers the measures and controls in the EP address CSIRO's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with CSIRO for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to CSIRO on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding CSIRO of the opportunity to provide feedback.

Western Australian Marine Science Institution (WAMSI)			
Consultation overview and summary of response on this EP			
• On 2 December 2024, VOGA emailed WAMSI advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.12 and 1.1). o The email included an activity summary, a request for current research activities, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. o VOGA also sought advice on any research activities being undertaken that could intersect with the proposed activities under the EP. • On 13 January 2025, VOGA emailed WAMSI following up on the proposed activity and a Consultation Information Sheet (Record of Consultation, reference 4.15 and 1.1) o The email included an activity summary, a request for current research activities, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP. o VOGA also reiterated the request for advice on any research activities being undertaken that could intersect with the proposed activities under the EP.			
Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that WAMSI has no comment at this time.	VOGA considers the measures and controls in the EP address WAMSI's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with WAMSI for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to WAMSI on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding WAMSI of the opportunity to provide feedback.
Australian Institute of Marine Science (AIMS)
Consultation overview and summary of response on this EP

• On 2 December 2024, VOGA emailed AIMS advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.12 and 1.1).
  ○ The email included an activity summary, a request for current research activities, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  ○ VOGA also sought advice on any research activities being undertaken that could intersect with the proposed activities under the EP.
• On 13 January 2025, VOGA emailed AIMS following up on the proposed activity and a Consultation Information Sheet (Record of Consultation, reference 4.15 and 1.1)
  ○ The email included an activity summary, a request for current research activities, directions for how to provide input into the EP through

consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

- VOGA also reiterated the request for advice on any research activities being undertaken that could intersect with the proposed activities under the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that AIMS has no comment at this time.	VOGA considers the measures and controls in the EP address AIMS's functions, interests or activities.

Consultation demonstration statement
VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with AIMS for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically: **Sufficient Information** • Consultation information provided to AIMS on 2 December 2024 based on their function, interest and activities. • Consultation Information Sheet has been publicly available on the VOGA website since December 2024. **Reasonable period** • A consultation period was noted in the initial consultation correspondence, and consultation material was sent. • Consultation for this EP commenced in December 2024. **Reasonable opportunity** • VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons. • From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA. • VOGA sent follow-up consultation emails on 13 January 2025, reminding AIMS of the opportunity to provide feedback.
Australian Marine Sciences Association (WA Branch) (AMSA)
Consultation overview and summary of response on this EP

• On 2 December 2024, VOGA emailed AMSA advising of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.12 and 1.1).
  ○ The email included an activity summary, a request for current research activities, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  ○ VOGA also sought advice on any research activities being undertaken that could intersect with the proposed activities under the EP.
• On 13 January 2025, VOGA emailed AMSA following up on the proposed activity and a Consultation Information Sheet (Record of Consultation, reference 4.15 and 1.1)
  ○ The email included an activity summary, a request for current research activities, directions for how to provide input into the EP through

consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

- VOGA also reiterated the request for advice on any research activities being undertaken that could intersect with the proposed activities under the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that AMSA has no comment at this time.	VOGA considers the measures and controls in the EP address AMSA's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation AMSA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to AMSA on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.

- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding AMSA of the opportunity to provide feedback.

Local environment and conservation groups or organisations

Protect Ningaloo

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA advised Protect Ningaloo by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Protect Ningaloo following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Protect Ningaloo has no comment at this time.	VOGA considers the measures and controls in the EP address Protect Ningaloo's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Protect Ningaloo for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Protect Ningaloo on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Protect Ningaloo of the opportunity to provide feedback.

Australian Conservation Foundation (ACF)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA advised ACF by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information.
- On 13 January 2025, VOGA emailed ACF following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that ACF has no comment at this time.	VOGA considers the measures and controls in the EP address ACF's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with ACF for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to ACF on 2 December 2024 based on their function, interest and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding ACF of the opportunity to provide feedback.

The Conservation Council of WA (CCWA)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA advised CCWA by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information.
- On 13 January 2025, VOGA emailed CCWA following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that CCWA has no comment at this time.	VOGA considers the measures and controls in the EP address CCWA's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with CCWA for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to CCWA on 2 December 2024 based on their function, interest and activities.
- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding CCWA of the opportunity to provide feedback.

Care for Hedland

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA advised Care for Hedland by email of the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 3.1 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date, and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the environment that may be affected based on a review of publicly available information.
- On 13 January 2025, VOGA emailed Care for Hedland following up on the proposed activity and provided a Consultation Information Sheet (Record of Consultation, reference 4.1 and 1.1).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received, VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA accepts that Care for Hedland has no comment at this time.	VOGA considers the measures and controls in the EP address Care for Hedland's functions, interests or activities.

Consultation demonstration statement

VOGA has discharged its obligations for consultation under regulation 25 of the Environment Regulations, and consultation with Care for Hedland for the purpose of regulation 25 is complete. Sufficient information, a reasonable period and a reasonable opportunity have been provided, as described in Section 10 of the EP and regulation 25 (2) and (3). Specifically:

Sufficient Information

- Consultation information provided to Care for Hedland on 2 December 2024 based on their function, interest and activities.

- Consultation Information Sheet has been publicly available on the VOGA website since December 2024.

Reasonable period

- A consultation period was noted in the initial consultation correspondence, and consultation material was sent.
- Consultation for this EP commenced in December 2024.

Reasonable opportunity

- VOGA published advertisements in six national, state, and relevant local newspapers (See Appendix F, Consultation Activities), from 27 November 2024 – 15 January 2025 advising of the proposed activities and requesting consultation from relevant persons.
- From 28 November 2024 to 17 January 2025, VOGA ran two social media advertisement campaigns (See Appendix F, Consultation Activities) targeting potentially relevant persons within the project EMBA.
- VOGA sent follow-up consultation emails on 13 January 2025, reminding Care for Hedland of the opportunity to provide feedback.

Table 7: Consultation Report with Non-Relevant Persons or Organisations

Section 25(1)(d) of the OPGGS(E)R: Persons or organisations whose functions, interests or activities may be affected by the activities to be carried out under the environment plan
Commonwealth commercial fishing - representative bodies
Australian Southern Bluefin Tuna Fishery Association (ASBITA)
Consultation overview and summary of response on this EP

• On 2 December 2024, VOGA emailed ASBITA advising of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information Sheet (Record of Consultation, references 3.5, 1.1 and 1.2).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  ○ The Commercial Fisher Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; the location and timing of activities; an outline of the activities to be conducted; a list of relevant state and Commonwealth-managed fisheries and an overview of consultation plans within the Operational Area and the EMBA.
  ○ VOGA also acknowledged WAFIC's consultation guidance and advised it had consulted with fishing industry associations directly and has applied this by consulting with relevant fishing industry associations for commercial fisheries identified as having potential for interaction in the operational area and EMBA.
• On 13 December 2024, ASBITA emailed VOGA confirming the receipt of the consultation and confirmed it was a relevant person for consultation (SI Report, reference 3.1.1).
  ○ The email included information on the Southern Bluefin Tuna population, spawning grounds and migration activity, outlined the overlap of the project EMBA, and welcomed further consultation.
• On 18 December 2024, VOGA emailed ASBITA, thanking them for their response and the information provided (SI Report, reference 3.1.2). The email acknowledged the information ASBITA shared regarding the Southern Bluefin Tuna fishery and its management and migratory patterns, as well as the cooperative management efforts through the Commission for the Conservation of Southern Bluefin Tuna.
  ○ The email noted that activities conducted would have a minimal impact on the Southern Bluefin Tuna population. VOGA welcomed further consultation with ASBITA.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
ASBITA advised of the potential impact on the spawning grounds and migratory activity of Southern Bluefin Tuna due to seismic activity. While feedback has been received, there were no objections or claims on this EP.	VOGA accepts the potential impact on the spawning grounds of migratory Southern Bluefin Tuna.	VOGA has reviewed the potential impact and ensures that the activities of this EP have minimal impact on the Southern Bluefin Tuna population. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and Revision process (Section 8.11 of the EP).	VOGA considers the measures and controls in the EP are appropriate. No additional measures or controls are required.

Consultation demonstration statement

While ASBITA is not a relevant person under regulation 25 of the Environment Regulations, VOGA chose to contact them and considers it has still provided sufficient information and a reasonable period outside of regulatory requirements for ASBITA to provide feedback during the consultation process.

Commonwealth Fisheries Association (CFA)
Consultation overview and summary of response on this EP

• On 13 November 2024, VOGA emailed CFA to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.14).
  ○ VOGA sought CFA's input on the preferred method of consultation with commercial fisheries and aims to ensure the engagement is tailored to meet their needs.
  ○ VOGA also provided information on confidentiality and the option to opt out of the consultation.
• On 2 December 2024, VOGA emailed CFA advising of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information Sheet (Record of Consultation, references 3.5, 1.1 and 1.2).
  ○ The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  ○ The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  ○ The Commercial Fisher Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; the location and timing of activities; an outline of the activities to be conducted; a list of relevant state and Commonwealth-managed fisheries and an overview of consultation plans within the Operational Area and the EMBA.
  ○ VOGA also acknowledged WAFIC's consultation guidance and advised it had consulted with fishing industry associations directly and has applied this by consulting with relevant fishing industry associations for commercial fisheries identified as having potential for interaction in the operational area and EMBA.
• On 13 January 2025, VOGA emailed CFA following up on the proposed activity and provided information for the commercial fishing sector, a Consultation Information Sheet and Commercial Fishing Information Sheet (Record of Consultation, reference 4.2, 1.1 and 1.2).
  ○ The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
  ○ The email also provided information for the Commercial Fishing Sector as supplied on 2 December 2024.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA has reviewed the potential impact and ensures that the activities of this EP have minimal impact on the CFA and their activities.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA considers the measures and controls in the EP address CFA's functions, interests or activities.

Consultation demonstration statement

While CFA is not a relevant person under regulation 25 of the Environment Regulations, VOGA chose to contact them and considers it has still provided sufficient information and a reasonable period outside of regulatory requirements for CFA to provide feedback during the consultation process.

Pearl Producers Association (PPA)

Consultation overview and summary of response on this EP

- On 13 November 2024, VOGA emailed PPA to introduce their operations and upcoming activities in the Wandoo Field (Record of Consultation, reference 2.15).
  - VOGA sought PPA's input on the preferred method of consultation with commercial fisheries and aims to ensure the engagement is tailored to meet their needs.
  - VOGA also provided information on confidentiality and the option to opt out of the consultation.
- On 2 December 2024, VOGA emailed PPA advising of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information Sheet (Record of Consultation, references 3.5, 1.1 and 1.2).
  - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
  - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
  - The Commercial Fisher Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; the location and timing of activities; an outline of the activities to be conducted; a list of relevant state and Commonwealth-managed fisheries and an overview of consultation plans within the Operational Area and the EMBA.
  - VOGA also acknowledged WAFIC's consultation guidance and advised it had consulted with fishing industry associations directly and has

applied this by consulting with relevant fishing industry associations for commercial fisheries identified as having potential for interaction in the operational area and EMBA.

- On 13 January 2025, VOGA emailed PPA following up on the proposed activity and provided information for the commercial fishing sector, a Consultation Information Sheet and Commercial Fishing Information Sheet (Record of Consultation, reference 4.2, 1.1 and 1.2).
    - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
    - The email also provided information for the Commercial Fishing Sector as supplied on 2 December 2024.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA has reviewed the potential impact and ensures that the activities of this EP have minimal impact on the PPA and their activities.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA considers the measures and controls in the EP address PPA's functions, interests or activities.

Consultation demonstration statement

While PPA is not a relevant person under regulation 25 of the Environment Regulations, VOGA chose to contact them and considers it has still provided sufficient information and a reasonable period outside of regulatory requirements for PPA to provide feedback during the consultation process.

Seafood Industry Australia (SIA)
Consultation overview and summary of response on this EP
• On 2 December 2024, VOGA emailed SIA advising of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information Sheet (Record of Consultation, references 3.5, 1.1 and 1.2). o The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation. o The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information. o The Commercial Fisher Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; the location and timing of activities; an outline of the activities to be conducted; a list of relevant state and Commonwealth-managed fisheries and an overview of consultation plans within the Operational Area and the EMBA. o VOGA also acknowledged WAFIC's consultation guidance and advised it had consulted with fishing industry associations directly and has applied this by consulting with relevant fishing industry associations for commercial fisheries identified as having potential for interaction in the operational area and EMBA. • On 13 January 2025, VOGA emailed SIA following up on the proposed activity and provided information for the commercial fishing sector, a Consultation Information Sheet and Commercial Fishing Information Sheet (Record of Consultation, reference 4.2, 1.1 and 1.2). o The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP. o The email also provided information for the Commercial Fishing Sector as supplied on 2 December 2024.

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted
No response was received on this EP despite follow up.	VOGA has reviewed the potential impact and ensures that the activities of this EP have minimal impact on the SIA and their activities.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA considers the measures and controls in the EP address SIA's functions, interests or activities.

Consultation demonstration statement

While SIA is not a relevant person under regulation 25 of the Environment Regulations, VOGA chose to contact them and considers it has still provided sufficient information and a reasonable period outside of regulatory requirements for SIA to provide feedback during the consultation process.

Tuna Australia (TA)

Consultation overview and summary of response on this EP

- On 2 December 2024, VOGA emailed TA advising of the proposed activity and provided a Consultation Information Sheet and Commercial Fisher Information Sheet (Record of Consultation, references 3.5, 1.1 and 1.2).
    - The email included an activity summary, directions for how to provide input into the EP development through consultation, the consultation closing date and a link to VOGA's website with additional resources on EP consultation.
    - The Consultation Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; and the presence, of environmental, social, economic and cultural features and/or values within the Operational Area and the Environment That May Be Affected (EMBA) based on a review of publicly available information.
    - The Commercial Fisher Information Sheet included an overview of the proposed activities; potential impacts, risks and management measures; the location and timing of activities; an outline of the activities to be conducted; a list of relevant state and Commonwealth-managed fisheries and an overview of consultation plans within the Operational Area and the EMBA.
    - VOGA also acknowledged WAFIC's consultation guidance and advised it had consulted with fishing industry associations directly and has applied this by consulting with relevant fishing industry associations for commercial fisheries identified as having potential for interaction in the

operational area and EMBA.

- On 13 January 2025, VOGA emailed TA following up on the proposed activity and provided information for the commercial fishing sector, a Consultation Information Sheet and Commercial Fishing Information Sheet (Record of Consultation, reference 4.2, 1.1 and 1.2).
  - The email included an activity summary, directions for how to provide input into the EP through consultation, a reminder of the date that consultation is proposed to close and confirmation that VOGA would continue to receive feedback through ongoing consultation through the life of the EP.
  - The email also provided information for the Commercial Fishing Sector as supplied on 2 December 2024.
- On 21 January 2025, TA emailed VOGA, providing its industry position statement regarding the management of consultation with energy companies. TA outlined information about its consultation services agreement to run consultations on behalf of VOGA with all fishers with fishing rights in the ETBF, WTBF and the Eastern and Western Skipjack fisheries. TA advised it has the authority to act on behalf of concession holders. (SI Report, reference 3.2.1 and 3.2.1.1).
  - The email also included an attached consulting services agreement outlining the scope, terms, and services provided by TA as part of its consultation services (SI Report, reference 3.2.1.2).
- On 14 February 2025, VOGA emailed TA to thank them for providing the industry position statement (SI Report, reference 3.2.2).
  - VOGA noted TA's advice and outlined that it would consider and apply it to any future EP where TA's members are considered relevant for consultation.
  - VOGA also thanked TA for providing the consultation services agreement and outlined that no fee-for-service agreement would be required for this EP as there is no expected impact to the fisheries represented by TA (WTBF or West Australian Skipjack Fishery).
    - VOGA advised it determined there has not been active fishing from these fisheries in the Operational Area in the past 10 years.
  - VOGA thanked TA for their guidance and any ongoing consultation for future EPs.

Relevant person objections, claims or other feedback	**VOGA's assessment of the merits**	**VOGA's statement of response**	**Details of the measures adopted**
Tuna Australia provided an industry position statement for consultation with energy companies and advised it has the authority to act on behalf of concession holders. While feedback has been received, there were no objections or claims on this EP.	VOGA accepts Tuna Australia's position statement.	VOGA acknowledged Tuna Australia's consultation advice and would consider and apply this for future EPs where TA concession holders are considered relevant for consultation. VOGA engages in ongoing consultation throughout the life of an EP. VOGA notes that further feedback may be received as part of ongoing consultation and where appropriate, VOGA will apply its Management of Change and	VOGA considers the measures and controls in the EP that address Tuna Australia's functions, interests or activities.

		Revision process (Section 8.11 of the EP).	

Consultation demonstration statement

While TA is not a relevant person under regulation 25 of the Environment Regulations, VOGA chose to contact them and considers it has still provided sufficient information and a reasonable period outside of regulatory requirements for TA to provide feedback during the consultation process.

Individual - Self identified

Individual 1

Consultation overview and summary of response on this EP

- On 15 January 2025, Individual 1 called the VOGA office and left a voice message referring to an advertisement in the newspaper for the Wandoo Environment Plan, and requested a call back on mobile (SI Report, reference 17.1.1).
  - In the message, Individual 1 said they were a Traditional Custodian in the area.
  - Individual 1 self-identified as a relevant person for consultation and wanted to speak with someone.
- On 16 January 2025, Individual 1 called the VOGA office and left a voice message referring to the advertisement in the newspaper for the Wandoo Environment Plan Wandoo Environment Plan, and requested a call back on mobile (SI Report, reference 17.1.2).
- On 23 January 2025, VOGA called Individual 1 and left a voice mail following the call being unanswered. VOGA requested Individual 1 to call back (SI Report, reference 17.1.3).
- On 24 January 2025, VOGA called Individual 1 and left a voice mail following the call being unanswered. VOGA requested Individual 1 to call back (SI Report, reference 17.1.4).
- On 28 January 2025, VOGA called Individual 1 and left a voice mail following the call being unanswered. VOGA requested Individual 1 to call back (SI Report, reference 17.1.5).
- On 3 February 2025, VOGA sent a text message to Individual 1 to clarify that they were calling on behalf of VOGA, and to request a call back or a relevant contact email for further consultation (SI Report, reference 17.1.6).

Relevant person objections, claims or other feedback	VOGA's assessment of the merits	VOGA's statement of response	Details of the measures adopted

No response was received on this EP despite follow up.	Nil.	VOGA engages in ongoing consultation throughout the life of an EP. Should feedback be received VOGA will apply its Management of Change and Revision process, where appropriate (Section 8.11 of the EP).	VOGA considers the measures and controls in the EP address Individual 1's functions, interests or activities.
Consultation demonstration statement			
While Individual 1 is not a relevant person under regulation 25 of the Environment Regulations, VOGA chose to contact them and considers it has still provided sufficient information and a reasonable period outside of regulatory requirements for Individual 1 to provide feedback during the consultation process.			

1.4.2. Record of Consultation

TABLE OF CONTENTS

1. Consultation Materials

1.1. Consultation Information Sheet

VERMILION ENERGY

INFORMATION SHEET

Wandoo Field

Exploration Drilling Environment Plan

December 2024

About Vermilion Energy

Vermilion Energy is an international energy producer with a 30-year track record. It has operations in North America, Europe and Australia.

Vermilion Oil and Gas Australia (Vermilion) is a subsidiary of Vermilion Energy and has operated in Australia for over 20 years. Our Australian operations focus on exploring for and developing oil at the Wandoo Field off the shore of Western Australia.

About Wandoo Field

The Wandoo Field was discovered in 1991 and the extraction of oil started in 1993. Vermilion has been the operator since November 2005 and the sole titleholder since 2007.

The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island (**Figure 1**). It operates at a water depth in the range from 50m–60m.

The Wandoo Facility operates under existing accepted Environmental Plans in place for production and well construction.

Operational Areas

Operational Areas have been defined as a subset of WA-14-L, to encompass the exploration prospects. Co-ordinates of the exploration prospects are listed in **Table 2**, with Operational Areas of a 4 x 4km square centred around these geographical co-ordinates (see **Figure 2**).

Activity overview

Vermilion currently operates the Wandoo Facility within the production licence area WA-14-L. Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan (EP).

The activity duration is expected to be between approximately 15 to 20 days of continuous drilling operations for each well drilled. The expected duration is a forecast and is subject to change based on Mobile Offshore Drilling Unit (MODU) availability or adverse weather conditions. A summary of the activity is provided in **Table 1.**

Communications with mariners

A temporary 500m safety exclusion zone will apply around the drilling rig. Commercial fishers and other marine users are permitted to use the Operational Areas but should take care around the operations by adhering to standard navigation rules and remain clear of the safety exclusion zone.

Marine notices will be issued prior to activity commencement to alert vessels which may be operating in waters nearby.

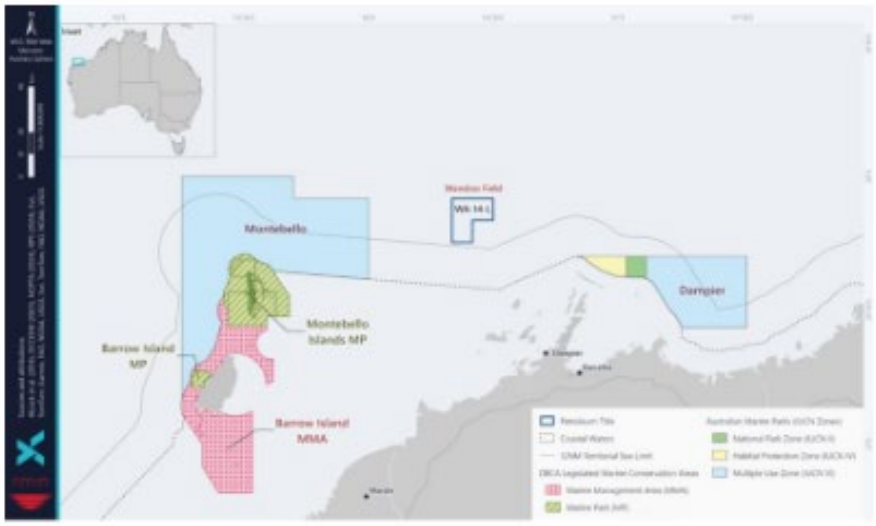


Figure 1. Location of the Wandoo Field

VERMILION Oil & Gas Australia Pty. Ltd.

Activity summary

Table 1: Activity summary

Production licence area	WA-14-L
Approximate duration and timing of activities	• 15-20 days (per well/campaign). • The first well is proposed to be drilled in Q4 2025 – Q1/Q2 2026, pending regulatory approval and rig availability. • The timing of subsequent activities has not been finalised. The Wandoo Field Exploration Drilling EP assumes the activities may be undertaken at any time of year over the five year period following acceptance of the EP.
Approximate water depth	50-60m
Key activities	The approach to exploration drilling is summarised in the following key steps: • Using an approved transit route specialist anchor handling vessels will manoeuvre the drilling rig into place. • The drilling rig will be positioned at sites determined as suitable by the seabed assessments. • Surface hole section will be drilled and cased, and then a riser and Blow-out Preventer (BOP) to prevent release of hydrocarbons installed. • The well would then be drilled to reach the reservoir. • Once the exploration wells have been drilled and evaluated, they will be Plugged and Abandoned (P&A) so hydrocarbons cannot be released, and all equipment removed from the seabed.
Vessels	• One jack-up MODU (drilling rig). • One to four support vessels (typically two for drilling rig support) will be involved in the activity. • Vessel details are not known at this time.
Remotely operated vehicle (ROV)	A light work-class ROV will be available on location to be used to support drilling rig operations. ROV activities may include survey and monitoring operations.
Helicopters	Helicopters will be used for crew changes, critical equipment supply, surveillance and emergency response uses.
Drilling muds and cuttings	Vermilion drilling operations will use only water-based fluids called 'muds' to lubricate and stabilise the wellbores in each section and remove drilling cuttings. Drill cuttings are rock chips from the sedimentary layers that emerge from the drilling process and range from very fine to pebble sized. Water-based muds are recycled as much as possible during the drilling process. The cuttings will be processed on the drilling rig before they are discharged overboard, where they will settle rapidly on the seafloor around the well site. This is standard industry practice in Australia. Marine mammals and fish may transit through these areas but will usually avoid the temporary disturbance. Any exposure to suspended sediment before it settles on the seabed will be highly localised and temporary due to high dilution and fast dispersal in the water column.
Operational area and exclusion zones	A temporary 500m safety exclusion zone will be in place around the drilling rig to manage vessel movements. No restrictions to other vessels within the Operational Area apart from being advised to take care during the drilling activities.
Description of the environment	The Operational Area is located within the Northwest Shelf provincial bioregion (based on the Integrated Marine and Coastal Regionalisation). Proximity to key features include: *Aboriginal cultural heritage* • There are no registered Aboriginal cultural heritage sites within the Operational Area. *Biologically important areas (BIAs)* The following BIAs intersect the Operational Area: • Wedge-tailed shearwater – Reproduction • Humpback whale – Migration • Flatback turtle – Reproduction • Whale shark – Foraging

	Heritage There are no World Heritage or National Heritage Properties within the Operational Area. The nearest heritage properties are: • Ningaloo Coast (World Heritage) ~250km from the Operational Area • Dampier Archipelago (National Heritage) ~35km from the Operational Area *Commercial fishing* The following Commonwealth managed fisheries have a defined management area that overlaps the Operational Area: • Southern Bluefin Tuna Fishery • Western Skipjack Tuna Fishery • Western Tuna and Billfish Fishery The following State-managed fisheries have a defined management area that overlaps the Operational Area: • Abalone Managed Fishery • Hermit Crab Fishery • Mackerel Managed Fishery • Marine Aquarium Managed Fishery • Nickol Bay Prawn Fishery • Onslow Prawn Limited Entry Fishery • Pilbara Crab Managed Fishery • Pilbara Line Fishery • Pilbara Fish Trawl Interim Managed Fishery • Pilbara Trap Managed Fishery • South-west Coast Salmon Fishery • Specimen Shell Managed Fishery • West Coast Deep Sea Crustacean Managed Fishery • Western Australian Sea Cucumber Fishery *Key ecological features (KEFs)* There are no KEFs within the Operational Area. The nearest KEFs are: • Glomar Shoals ~40km to the north-north-east of the Operational Area. • Ancient coastline at 125m depth contour ~56km to the north of the Operational Area. • Continental Slope Demersal Fish Communities ~118km north-west of the Operational Area. *Oil and gas operations* Petroleum activities within the vicinity of the Operational Area: • Reindeer platform ~14km from the Operational Area • Stag platform ~13km from the Operational Area • Scarborough export pipeline ~3km from the Operational Area • TL1 and TL2 export pipelines ~500m and ~18km from the Operational Area *Shipping* • The Operational Area is approximately 31km from the northbound shipping fairway from Dampier. *Protected areas* No Australian Marine Parks (AMPs) are within the Operational Area. The nearest AMPs are: • Montebello AMP ~37km to the west of the Operational Area • Dampier AMP ~47km to the south-east of the Operational Area • Montebello Islands Marine Part (State) ~75km to the west-south-west of the Operational Area • Barrow Island Marine Management Area (State) ~89km to the west-south-west of the Operational Area *Tourism, towns and communities* • The town of Dampier is located 80km south-south-east of the Operational Area.

Table 2: Prospect locations

Prospect names	Latitude	Longitude
Mottlecah	20° 8' 32.7" S	116° 23' 7.4" E
Jinjulu	20° 10' 44.6" S	116° 21' 21.4" E
Kullingal	20° 10' 16.2" S	116° 23' 3.2" E
North of Wandoo 1	20° 6' 5.2" S	116° 25' 0.6" E
North of Wandoo 2	20° 5' 16.2" S	116° 25' 46.6" E
North Jurassic	20° 5' 57.5" S	116° 23' 53.2" E
North West Jurassic	20° 5' 57.9" S	116° 21' 26.5" E

Environment that may be affected

The environment that may be affected (EMBA) is a mathematically modelled area of the largest possible spatial extent where the activities could potentially have an environmental consequence. The broadest extent of the model takes into consideration planned and unplanned activities.

For the Wandoo Field Exploration Drilling EP, the EMBA has been developed combining numerous modelling outputs, based on a release of hydrocarbons to the environment from a loss of well containment. This scenario is extremely unlikely to occur. The EMBA is shown in **Figure 2**.

The EMBA does not represent the extent of the predicted impact of a release of hydrocarbons. Rather, the EMBA represents the merged area of many possible paths that a hydrocarbon release could travel, depending on factors including the weather and ocean conditions at the time of the release.

This means that in the unlikely event that a hydrocarbon release does occur, the whole EMBA will not be affected. Only a minimal, specific part of the EMBA will be affected and that portion would only be known at the time of the release.

Assessment

Vermilion has undertaken an assessment of the potential impacts and risks to the environment as well as potential risks to relevant persons arising from the planned activities and unplanned events. This assessment considers the timing, duration and location of the activities. A number of mitigation and management measures will be implemented and are summarised in **Table 3**. Further details will be provided in the Wandoo Field Exploration Drilling EP.

In preparing the EP, Vermilion's intent is to minimise environmental, social and cultural risks and impacts associated with the proposed activities, and Vermilion seeks your feedback to inform our decision making.

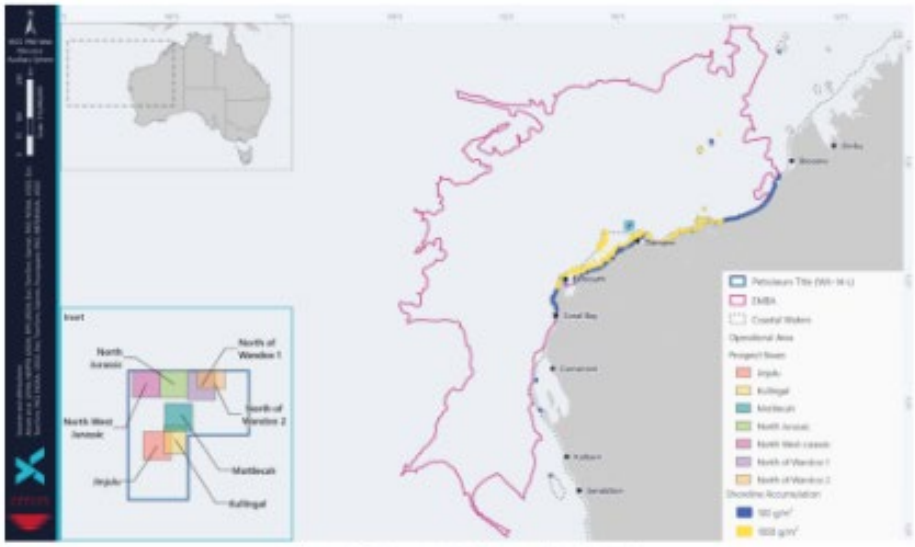


Figure 2: Environment that may be affected

Mitigation and management measures

Vermilion has undertaken an assessment to identify potential impacts and risks to the environment arising from the activity. A number of mitigation and management measures for the activity are outlined in **Table 3.** Further details will be provided in the Wandoo Field Exploration Drilling EP.

Table 3 Summary of key risks and/or impacts and preliminary management measures for the activity

Potential impact/risk	Source of potential impact/risk	Description of potential impact/risk	Preliminary draft mitigation and/or management measure
Planned activities (routine and non-routine)			
Physical presence: interaction with other marine users	Drilling rig and support vessels	Potential displacement of commercial fishing activities and commercial shipping vessels.	Drilling rig and vessel communication equipment will be maintained to allow for communication with commercial and recreational vessels. The Australian Hydrographic Office (AHO) and Australian Maritime Safety Authority (AMSA) will be notified prior to activities so appropriate marine notices can be issued. The drilling rig will have a restricted zone of 500m.
Physical presence: disturbance to seabed	Drilling rig, support vessels and ROV	Localised increase in turbidity. Potential impacts to benthic habitat and communities.	A Rig Move Plan will be prepared in accordance with the drilling contractor's Marine Operations Manual.
Routine acoustic emissions: generation of noise	Drilling rig, support vessels and Helicopters Vertical seismic profiling	Potential temporary or permanent injury or behavioural change in marine fauna.	Drilling rig and vessel engines and power equipment will be maintained to optimise smooth running. Vessels operating in the Operational Areas must adhere to Part 8 of Environment Protection and Biodiversity Conservation (EPBC) Regulation 2000 to minimise exposure of marine fauna to noise impacts.
Routine and non-routine discharges	Drilling rig and support vessels	Potential localised eutrophication of the water column and localised adverse effect to marine species.	Discharges such as deck drainage, bilge, garbage, food waste and sewage will be treated in accordance with: • MARPOL 73/78 Annex I and AMSA Marine Order 91. • MARPOL 73/78 Annex V. • MARPOL 73/78 Annex IV and AMSA Marine Order 96. • AMSA Marine Order 95.
Routine light emissions	Drilling rig, support vessels and ROV	Potential interference with or disturbance of marine fauna.	No controls identified as vessel lighting is specified for safe working practices.
Routine and non-routine discharges of drill cuttings and drilling fluids and cement	Drilling rig and plug and abandon activities	Potential toxic effects to marine species, localised reduction in water quality.	Drilling fluids and cement components will be selected using the chemical assessment process. Drilling fluids will be processed using a solids control system to enable reuse of fluids and minimise the volume of fluids being discharged. Only water-based drilling muds will be used.
Routine and non-routine atmospheric and greenhouse gas emissions	Drilling rig and support vessels	Potential temporary decrease in local air quality.	The drilling rig and vessels, and fuels used will comply with Regulation 14 of MARPOL 73/78 Annex IV and AMSA Marine Order 97. Power generation systems, ancillary diesel engines and refrigeration systems will be maintained via preventative maintenance systems.

Unplanned events (accidents/incidents)			
Introduction and establishment of invasive marine species	Drilling rig and support vessels	Potential reduction in native species abundance due to competition or predation.	Drilling rig and vessels will comply with: • Australian Ballast Water Management Requirements consistent with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Management Convention). • Annex 1 of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships. • National Biofouling Guidelines for the Petroleum Production and Exploration Industry and IMO Guidelines for the control and management of a ship's biofouling to minimise the transfer of invasive aquatic species.
Vessel collision or disturbance of fauna	Support vessels	Potential injury of marine fauna.	Vessels contracted by Vermilion operating in the Operational Areas must have procedures that adhere to Part 8 of EPBC Regulation 2000 to minimise exposure of marine fauna.
Dropped objects	Drilling rig and support vessels	Decrease in water quality and potential toxic effects to marine species. Potential injury of marine fauna.	Drilling rig work procedures for lifts, bulk transfers and cargo loading will require: • the security of loads to be checked prior to commencing lifts. • loads to be covered if there is a risk of losing loose materials. • lifting operations to consider weather and sea state. Drilling rig inductions will include control measures and training for crew in dropped object prevention.
Accidental discharge materials and waste	Drilling rig and support vessels	Potential pollution and contamination of the marine environment. Decrease in water quality Injury of marine fauna.	Drilling rig and vessels' procedures are compliant with MARPOL Convention Annex V and Marine Order 95.
Minor spills	Drilling rig and support vessels	Decrease in water quality and potential toxic effects to marine species.	Intermediate bulk containers are transferred to/from vessels using a lifting cradle or are containerised. Cranes and lifting equipment are certified.
Loss of containment – marine diesel oil (MDO)	Support vessels	Decrease in water quality. Potential oiling of marine fauna and toxic effects to marine species.	AHO and AMSA will be notified in advance of drilling rig movements. Drilling rig and vessels will have navigational lights. Vessels will have dynamic positioning capability and trials will be performed as required. Dry break coupling on refuelling hose to minimise spill due to vessel loss of position.
Loss of well containment	Drilling rig	Decrease in water quality. Potential oiling of marine fauna and toxic effects to marine species.	Wells are designed and components are manufactured in compliance with the Vermilion Well Construction Standards Manual and relevant API or ISO specifications. Vermilion Drilling Supervisors, Completions Supervisors and Drilling Superintendents are required to hold current Well Control certification. BOPs are tested at regular intervals in accordance with API standard 53.
Hydrocarbon spill response activities	Spill response	Potential toxic effects to marine fauna from dispersants, disturbance	Vermilion maintains contracts with oil spill response organisations, operational and scientific

		to benthic habitat, scouring of sediments, and decrease in water quality.	monitoring providers, and logistics operators for support in the event of a hydrocarbon spill. Vermilion tests response arrangements annually to ensure preparedness for unplanned hydrocarbon spills. Implementation of response strategies will be undertaken as per the NOPSEMA-accepted Oil Pollution Emergency Plan (OPEP) and in consultation with or under direction of the Commonwealth or State Control Agency.

Consultation

Consultation provides Vermilion with an opportunity to receive feedback from authorities, persons and organisations whose functions, interests or activities may be affected by proposed petroleum activities. This feedback helps us to refine or change the management measures we are planning to address potential activity impacts and risks. Vermilion's objective for the proposed activities is to ensure the activity is carried out in a manner that is consistent with the principles of Ecologically Sustainable Development (ESD) and reduce environmental impacts and risks to a level that is As Low As Reasonably Practicable (ALARP) and acceptable over the life of the activity.

Consultation also helps us to identify values and sensitivities where information is not publicly available, such as spiritual and cultural connection to land and sea country, as well as first-hand feedback on commercial and recreationalfishing, tourism and local community activities and interests.

Feedback

If you consider you may be a relevant person, please contact us as soon as possible if you require any further information or if you think you are not on our consultation list.

We are asking for relevant persons to provide feedback by **17 January 2025.**

Feedback provided by relevant persons will be considered in an addendum to the Wandoo Field Exploration Drilling EP and through the life of the activity. Feedback from relevant persons will be included in the EP submitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment.

Please let us know if you would like your personal/organisational details or any part of your feedback to remain private and we will ensure this remains confidential to NOPSEMA.

Contact us

Website: www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

Email: abu.consultation@vermilionenergy.com

Phone: (08) 9217 5858

To visit our website, scan the QR code

1.2. Commercial Fisher Information Sheet

VERMILION ENERGY

COMMERCIAL FISHER INFORMATION SHEET

Wandoo Field

Exploration Drilling Environment Plan

December 2024

Information for commercial fishers

Information overview

This Commercial Fisher Information Sheet provides supplementary information to the Vermilion Oil and Gas Australia (Vermilion) general information sheet about the proposed exploration drilling in the Wandoo Field.

This Information Sheet provides supplementary information for the needs of commercial fishers who may be active in the Operational Area.

It summarises the ongoing assessment of potential impacts and risks to the commercial fishing industry and provides information for the needs of commercial fishers, who may be active in the Operational Area, about the proposed activities.

Activity overview

Vermilion currently operates the Wandoo Facility within the production licence area WA-14-L. Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan (EP).

The activity duration is expected to be between approximately 15 to 20 days of continuous drilling operations for each well drilled. The expected duration is a forecast and is subject to change based on mobile offshore drilling unit (MODU) availability or adverse weather conditions.

About Vermilion Energy

Vermilion Energy is an international energy producer with a 30-year track record. It has operations in North America, Europe and Australia.

Vermilion is a subsidiary of Vermilion Energy and has operated in Australia for over 20 years. Our Australian operations focus on exploring for and developing oil at the Wandoo Field off the shore of Western Australia.

About Wandoo Field

The Wandoo Field was discovered in 1991 and the extraction of oil started in 1993. Vermilion has been the operator of Wandoo Field since November 2005 and the sole titleholder since 2007.

The Wandoo Facility operates under existing accepted EPs in place for production and well construction.

Key information

- **Vessels:** One to four support vessels (typically two for drilling rig support) will be involved in the drilling activities. Vessel details are not known at this time.
- **Location:** The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island (**Figure 1**).
- **Operational Areas:** Commercial fishers and other marine users are permitted to use the Operational Areas but should take care around operations by adhering to standard navigation rules.
- **Timing and duration:** The first well is proposed to be drilled in Q4 2025 – Q1/Q2 2026, pending regulatory approval and rig availability. The activity duration is expected to be between approximately 15 to 20 days of continuous well operations for each well drilled.
- **Exclusion zones:** A temporary 500m safety exclusion zone will apply around the MODU to manage vessel movements. There will be no other restrictions to other vessels within the Operational Area.
- **Notifications:** Marine notices will be issued prior to activity commencement to alert vessels which may be operating in waters nearby.

Wandoo Field location

The Wandoo Field is located in Commonwealth waters within the Carnarvon Basin, approximately 80km northwest of the port of Dampier and 110km northeast of Barrow Island (**Figure 1**). It operates at a water depth in the range from 50m-60m.

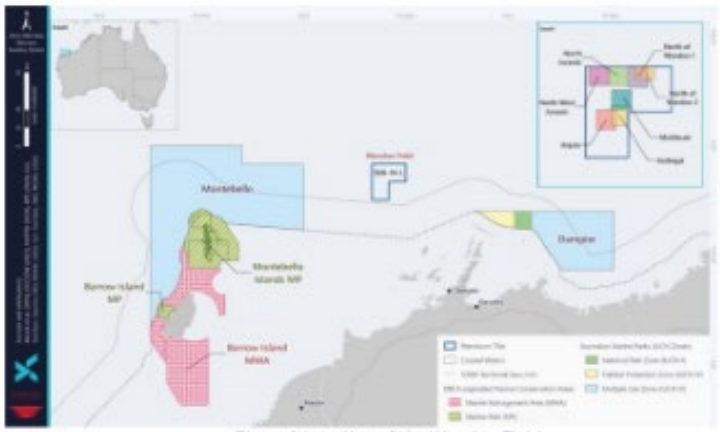


Figure 1. Location of the Wandoo Field

Operational Areas

Operational Areas have been defined as a subset of Permit WA-14-L, including an approximate 4 x 4km boundary surrounding each exploration prospect. Operational Areas are shown in the **Figure 1** inset and co-ordinates provided in **Table 1**.

Table 1. Coordinates of the Wandoo Field Operational Areas

Prospect names / Operational Areas	Corner	Latitude	Longitude
North West Jurassic	A	20° 6' 59.33968" S	116° 20' 26.64720" E
North West Jurassic	B	20° 6' 58.94753" S	116° 22' 45.82891" E
North West Jurassic	C	20° 4' 57.34916" S	116° 22' 45.83320" E
North West Jurassic	D	20° 4' 57.29532" S	116° 20' 27.15801" E
Kullingal	A	20° 11' 21.22383" S	116° 23' 2.89793" E
Kullingal	B	20° 11' 21.96433" S	116° 24' 51.85846" E
Kullingal	C	20° 9' 11.44104" S	116° 24' 50.78617" E
Kullingal	D	20° 9' 11.10559" S	116° 23' 3.40865" E
Mottlecah	A	20° 9' 37.70610" S	116° 23' 7.14156" E
Mottlecah	B	20° 9' 38.17225" S	116° 25' 24.93474" E
Mottlecah	C	20° 7' 28.05266" S	116° 25' 25.41201" E
Mottlecah	D	20° 7' 27.58741" S	116° 23' 7.65052" E
Jinjulu	A	20° 11' 49.62039" S	116° 21' 21.12177" E
Jinjulu	B	20° 11' 50.11044" S	116° 23' 38.94639" E
Jinjulu	C	20° 9' 39.99207" S	116° 23' 39.44902" E
Jinjulu	D	20° 9' 39.50297" S	116° 21' 21.65616" E
North of Wandoo 1	A	20° 7' 10.34410" S	116° 25' 0.37851" E
North of Wandoo 1	B	20° 7' 10.78478" S	116° 27' 18.13657" E
North of Wandoo 1	C	20° 5' 0.66387" S	116° 27' 18.58681" E
North of Wandoo 1	D	20° 5' 0.22405" S	116° 25' 0.86036" E
North of Wandoo 2	A	20° 6' 21.22356" S	116° 25' 46.34433" E
North of Wandoo 2	B	20° 6' 21.65399" S	116° 28' 4.09075" E
North of Wandoo 2	C	20° 4' 57.17177" S	116° 28' 4.37611" E
North of Wandoo 2	D	20° 4' 57.56346" S	116° 25' 47.51389" E
North Jurassic	A	20° 6' 59.39506" S	116° 22' 45.52891" E
North Jurassic	B	20° 6' 59.85576" S	116° 25' 0.50452" E
North Jurassic	C	20° 4' 58.19869" S	116° 25' 0.95531" E
North Jurassic	D	20° 4' 57.60294" S	116° 22' 46.40135" E

Notes: A – southwest corner; B – southeast corner; C – northwest corner; D – northeast corner.

Activity summary

Table 2 Activity summary

Production licence area	WA-14-L
Approximate duration and timing of activities	• 15-20 days (per well/campaign). • The first well is proposed to be drilled in Q4 2025 – Q1/Q2 2026, pending regulatory approval and rig availability. • The timing of subsequent activities has not been finalised. The Wandoo Field Exploration Drilling EP assumes the activities may be undertaken at any time of year over the five year period following acceptance of the EP.
Approximate water depth	50-60m
Key activities	The approach to exploration drilling is summarised in the following key steps: • Using an approved transit route specialist anchor handling vessels will manoeuvre the drilling rig into place. • The drilling rig will be positioned at sites determined as suitable by the seabed assessments. • Surface hole section will be drilled and cased, and then a riser and blow-out preventer to prevent release of hydrocarbons installed. • The well would then be drilled to reach the reservoir. • Once the exploration wells have been drilled and evaluated, they will be plugged and abandoned so hydrocarbons cannot be released, and all equipment removed from the seabed.
Vessels	• One jack-up MODU (drilling rig). • One to four support vessels (typically two for drilling rig support) will be involved in the activity. • Vessel details are not known at this time.
Remotely operated vehicle (ROV)	A light work-class ROV will be available on location to be used to support drilling rig operations. ROV activities may include survey and monitoring operations.
Helicopters	Helicopters will be used for crew changes, critical equipment supply, surveillance and emergency response uses.
Drilling muds and cuttings	Vermilion drilling operations will use only water-based fluids called 'muds' to lubricate and stabilise the wellbores in each section and remove drilling cuttings. Drill cuttings are rock chips from the sedimentary layers that emerge from the drilling process and range from very fine to pebble sized. Water-based muds are recycled as much as possible during the drilling process. The cuttings will be processed on the drilling rig before they are discharged overboard, where they will settle rapidly on the seafloor around the well site. This is standard industry practice in Australia. Marine mammals and fish may transit through these areas but will usually avoid the temporary disturbance. Any exposure to suspended sediment before it settles on the seabed will be highly localised and temporary due to high dilution and fast dispersal in the water column.
Operational Area and exclusion zones	A temporary 500m safety exclusion zone will be in place around the drilling rig to manage vessel movements. No restrictions to other vessels within the Operational Area apart from being advised to take care during the drilling activities.
Communication with fishers	Marine notices will be issued prior to activity commencement to alert vessels which may be operating in waters nearby. Coordinates will be provided to stakeholders 30 days before the commencement of any activities.

Assessment of commercial fishing potential effects and impacts

Commonwealth managed fisheries

There are three Commonwealth managedcommercial fisheries that have a defined management area overlapping the Operational Areas (**Table 3**).

Table 3: Commonwealth managed fisheries

Commonwealth managed fisheries	Summary of fishery in relation to Operational Areas	Assessment of potential impacts
Southern Bluefin Tuna Fishery	The Southern Bluefin Tuna Fishery operates around Australia and extends to the high seas fishing zone (out to 200nm from the coast). The fishery targetssouthern bluefin tuna only. Fishing activity is focused in southern Australian waters with no activity expected across the Operational Areas.	No impact to the fishery expected.
Western Skipjack Tuna Fishery	The Western Skipjack Tuna Fishery extends west from Cape York Peninsula and around Australia to the South Australian/Victorian border, out to the edge of the Australian Fishing Zone. Little fishing activity has been undertaken in this fishery since 2008. No fishing activity associated with this fishery is expected to occur within the Operational Areas.	No impact to the fishery expected.
Western Tuna and Billfish Fishery	The Western Tuna and Billfish Fishery management area extends over a large area westward from Cape York Peninsula off Queensland, around the west coast of Western Australia and eastward, across the Great Australian Bight to 141°E at the South Australian/Victorian border. The fishery has operated at low levels of effort since the early 2000's. Target species include albacore, bigeye tuna, yellowfin tuna, swordfish and striped marlin. No fishing activity associated with this fishery is expected to occur within the Operational Areas.	No impact to the fishery expected.

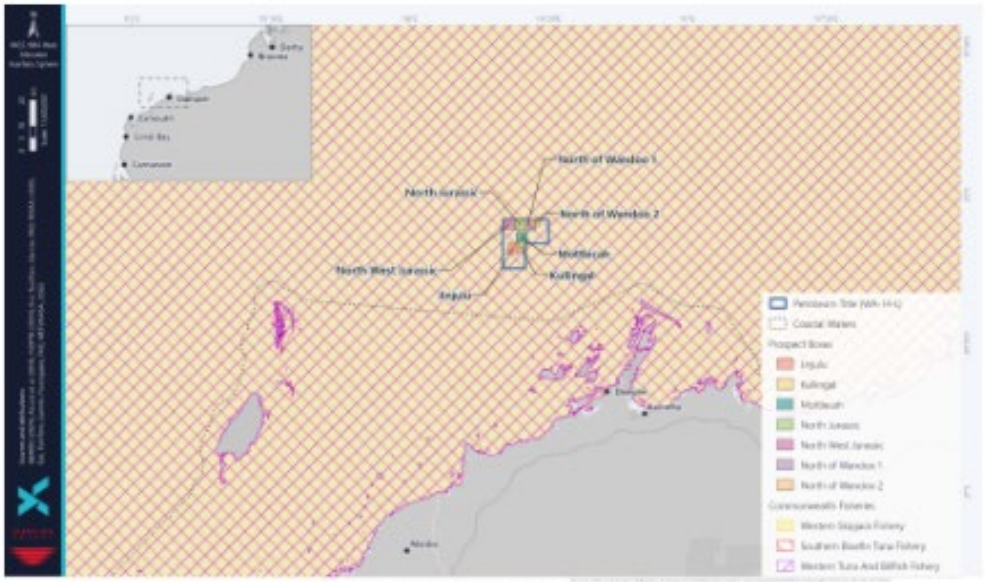


Figure 2: Commonwealth managed fisheries

State managed fisheries

State managed commercial fisheries that have historical fishing activity intersecting the Operational Area within the last 10 years include:

- Hermit Crab Fishery
- Mackerel Managed Fishery
- Marine Aquarium Managed Fishery
- Nickol Bay Prawn Fishery
- Onslow Prawn Limited Entry Fishery
- Pilbara Crab Managed Fishery
- Pilbara Line Fishery
- Pilbara Fish Trawl Interim Managed Fishery
- Pilbara Trap Managed Fishery
- Specimen Shell Managed Fishery, and
- Western Australian Sea Cucumber Fishery.

Figure 3 depicts the state managed commercial fisheries that had three or more vessels (per year) active within the Operational Areas.

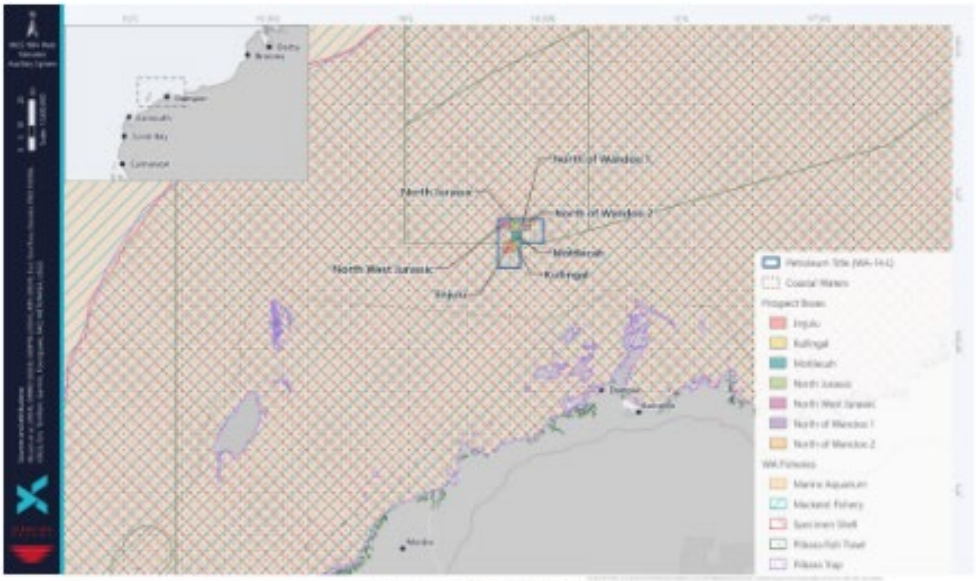


Figure 3. State managed fisheries

Vermilion impact assessment

Vermilion has undertaken an assessment to identify potential impacts and risks to commercial fishers from the activity. A number of mitigation and management measures for the activity are outlined in **Table 4.** Further details will be provided in the Wandoo Field Exploration Drilling EP.

Table 4. Potential interactions with commercial fishing

Potential impact	Description of potential impact/risk	Proposed control measures
Interference with commercial fishing activities	Potential displacement of commercial fishing activities	• Drilling rig and vessel communication equipment will be maintained to allow for communication with commercial fishing vessels. • The Australian Hydrographic Office (AHO) and Australian Maritime Safety Authority (AMSA) will be notified prior to activities so appropriate marine notices can be issued. • The drilling rig will have an exclusion zone of 500m.
Introduction and establishment of invasive marine species	Potential reduction in commercial species abundance due to competition or predation.	The drilling rig and vessels will comply with: • Australian Ballast Water Management Requirements consistent with the International Convention for the Control and Management of Ships' Ballast Water and Sediments (Ballast Water Management Convention). • Annex 1 of the International Convention on the Control of Harmful Anti-Fouling Systems on Ships. • National Biofouling Guidelines for the Petroleum Production and Exploration Industry and IMO Guidelines for the control and management of a ship's biofouling to minimise the transfer of invasive aquatic species.
Vessel collision	Decrease in water quality. Potential toxic effects to commercial species.	• AHO and AMSA will be notified in advance of vessel activities. • The drilling rig and vessels will have navigational lights. • The vessels will have dynamic positioning capability. • The drilling rig and vessels will be equipped and crewed in accordance with the *Navigation Act 2012* and Marine Orders. • Vessels will have a dedicated Ship Oil Pollution Prevention Plan (SOPEP). • An Oil Pollution Emergency Plan (OPEP) will be prepared and implemented as required.

Consultation

Consultation provides Vermilion with an opportunity to receive feedback from authorities, persons and organisations whose functions, interests or activities may be affected by proposed petroleum activities. This feedback helps us to refine or change the management measures we are planning to address potential activity impacts and risks. Vermilion's objective for the proposed activities is to ensure the activity is carried out in a manner that is consistent with the principles of Ecologically Sustainable Development (ESD) and reduce environmental impacts and risks to a level that is As Low As Reasonably Practicable (ALARP) and acceptable over the life of the activity.

Consultation also helps us to identify values and sensitivities where information is not publicly available, such as spiritual and cultural connection to land and sea country, as well as first-hand feedback on commercial and recreational fishing, tourism and local community activities and interests.

Feedback

Vermilion is committed to working together with the commercial fishing industry so that we can all proceed with business in a safe and efficient manner.

If you consider you may be a relevant person, please contact us as soon as possible if you require any further information or if you think you are not on our consultation list.

We are asking for relevant persons to provide feedback by **17 January 2025.**

Feedback provided by relevant persons will be considered in an addendum to the Wandoo Field Exploration Drilling EP and through the life of the activity. Feedback from relevant persons will be included in the EP submitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment.

Please let us know if you would like your personal/organisational details or any part of your feedback to remain private and we will ensure this remains confidential to NOPSEMA.

Contact us

Website: www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

Email: abu.consultation@vermilionenergy.com

Phone: (08) 9217 5858

To visit our website, scan the QR code

1.3. Summary Information Sheet

VERMILION ENERGY

SUMMARY INFORMATION SHEET
Wandoo Field
Exploration Drilling Environment Plan
December 2024

More information is available in the general Wandoo Field Exploration Drilling Environment Plan Consultation Information Sheet.

Introduction

Vermilion Energy is an international energy producer with 30 years of experience. It operates in North America, Europe and Australia. Vermilion Oil and Gas Australia (the Australian branch) has been operating in Australia for over 20 years. Our Australian operations focus on finding and developing oil and gas at the Wandoo Field off the shore of Western Australia.

The Wandoo Field was discovered in 1991 and oil extraction started in 1993. Vermilion has managed Wandoo since November 2005 and owned it completely since 2007. The Wandoo Field operates under approved Environmental Plans for production at the facility and well construction.

The Wandoo Field is located in Commonwealth waters in the Carnarvon Basin, about 80km northwest of the port of Dampier and 110km northeast of Barrow Island. It operates in water depth of 50m - 60m (**Figure 1**).

Activity details

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one new near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L, under the Wandoo Field Exploration Drilling Environment Plan (EP).

Activity information

- Drilling each well is expected to take approximately 15 to 20 days. This depends on factors such as the availability of a Mobile Offshore Drilling Unit (MODU), severe weather conditions and any technical or equipment issues during the drilling activities.
- The first well is planned for late 2025, pending regulatory approval and rig availability.
- The timing for other activities is not yet decided. The Wandoo Field Exploration Drilling EP assumes the activities could happen at any time of the year over the five years after the EP is accepted.
- Potential impacts, as detailed in the Exploration Drilling Environment Plan Consultation Information Sheet, include noise, the physical presence of a drilling rig and support vessels, routine and non-routine discharges, and atmospheric emissions.

Location

The activities will take place under Vermilion's existing permit area at the Wandoo Field (WA-14-L). The Exploration Drilling Environment Plan Consultation Information Sheet lists the geographical coordinates of the exploration prospects.

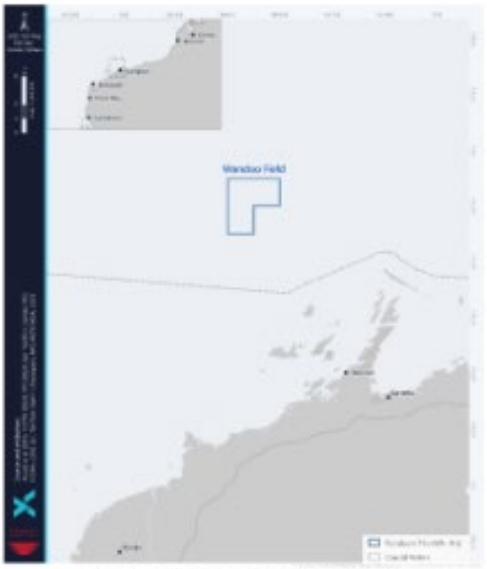


Figure 1. Location of the Wandoo Field

Pictured: Mobile offshore drilling unit (left), Wandoo B (right)

Environmental impacts and management

This work program includes planned activities but may also result in unplanned activities. Both may impact the environment. A table showing all planned and unplanned activities, potential impacts, and management measures for each is included in the general Wandoo Field Exploration Drilling Information Sheet.

The objective is to manage the work program to reduce impacts and risks to as low as reasonably possible.

The total area over which unplanned events could have an environmental impact is shown in **Figure 2.** This is referred to as the environment that may be affected (EMBA).

In the highly unlikely event that an unplanned activity such as a fuel from a vessel collision or oil release from one of the wells occurs, the entire EMBA would not be affected. The part of the EMBA that would be affected would only be known at the time of the event.

Figure 2: Environment that may be affected

Pictured: Wandoo Field, Wandoo A (left) and Wandoo B (right)

Consultation

Consultation provides Vermilion with an opportunity to receive feedback from those whose functions, interests or activities may be affected by proposed activities. This feedback helps us to refine the management measures to address potential activity impacts and risks.

Consultation also helps us to identify values and sensitivities where information is not publicly available.

Feedback

If you consider you may be a relevant person, please get in touch with us as soon as possible if you require any further information or if you think you are not on our consultation list. We are asking for relevant persons to provide feedback by **17 January 2025**.

Feedback provided by relevant persons will be considered in an addendum to the Wandoo Field Exploration Drilling EP and throughout the life of the activity. Feedback from relevant persons will be included in the EP submitted to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment.

Please let us know if you would like your personal/ organisational details or any part of your feedback to remain private and we will ensure this remains confidential to NOPSEMA.

Contact us

Website: www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities

Email: abu.consultation@vermilionenergy.com

Phone: (08) 9217 5858

2. Initial Consultation Outreach – October and November 2024

2.1. Email to Wanparta Aboriginal Corporation RNTBC (WAC) on 9 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Wanparta Aboriginal Corporation RNTBC (**WAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Ngarla and Ngarla #2 Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the WAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How WAC would like to be contacted and engaged for consultation; and
2. If WAC has a requirement for a formalised consultation agreement to be in place, and if WAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the WAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans **(EPs**); and
3. provide general information about Vermilion.

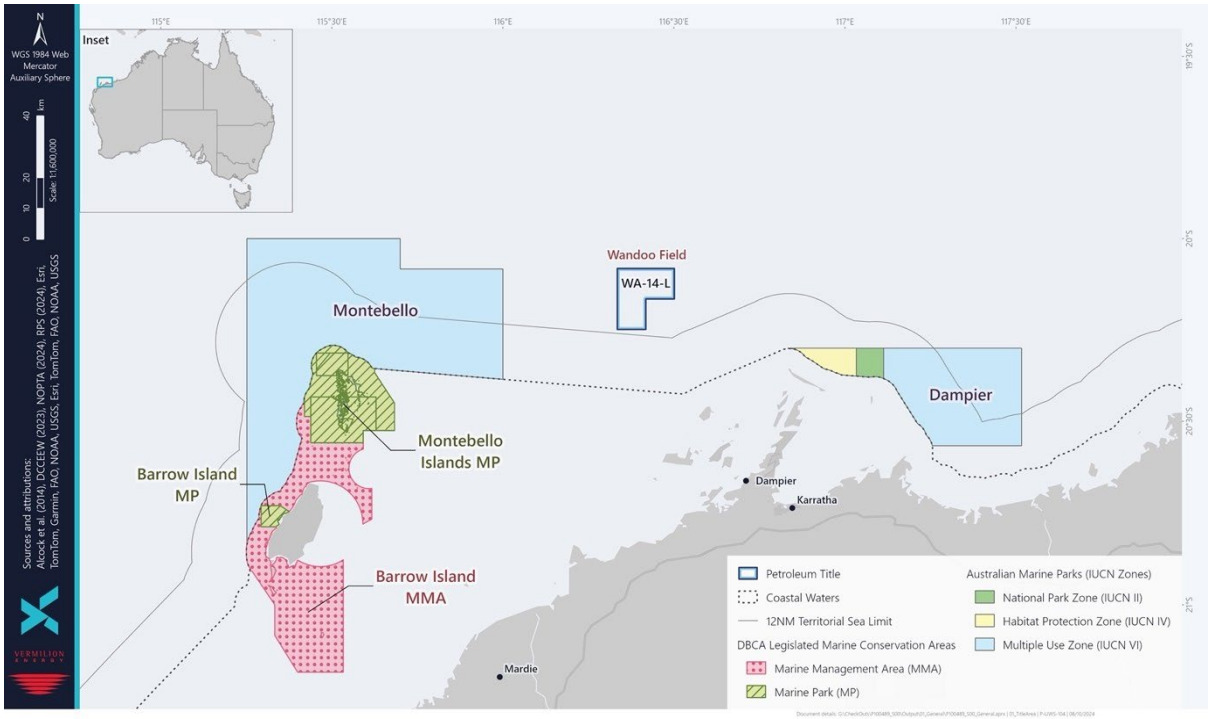
This is Vermilion's first consultation for an EP, and our client welcomes the engagement with WAC.

Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet WAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from WAC.

The purpose of this consultation is to give WAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;
- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on WAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.2. Email to Karajarri Traditional Lands Association (Aboriginal Corporation) RNTBC (KTLAAC) on 9 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Karajarri Traditional Lands Association (Aboriginal Corporation) RNTBC (**KTLAAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Karajarri Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the KTLAAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How KTLAAC would like to be contacted and engaged for consultation; and
2. If KTLAAC has a requirement for a formalised consultation agreement to be in place, and if KTLAAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the KTLAAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EP**s); and
3. provide general information about Vermilion.

This is Vermilion's first consultation for an EP, and our client welcomes the engagement with KTLAAC.

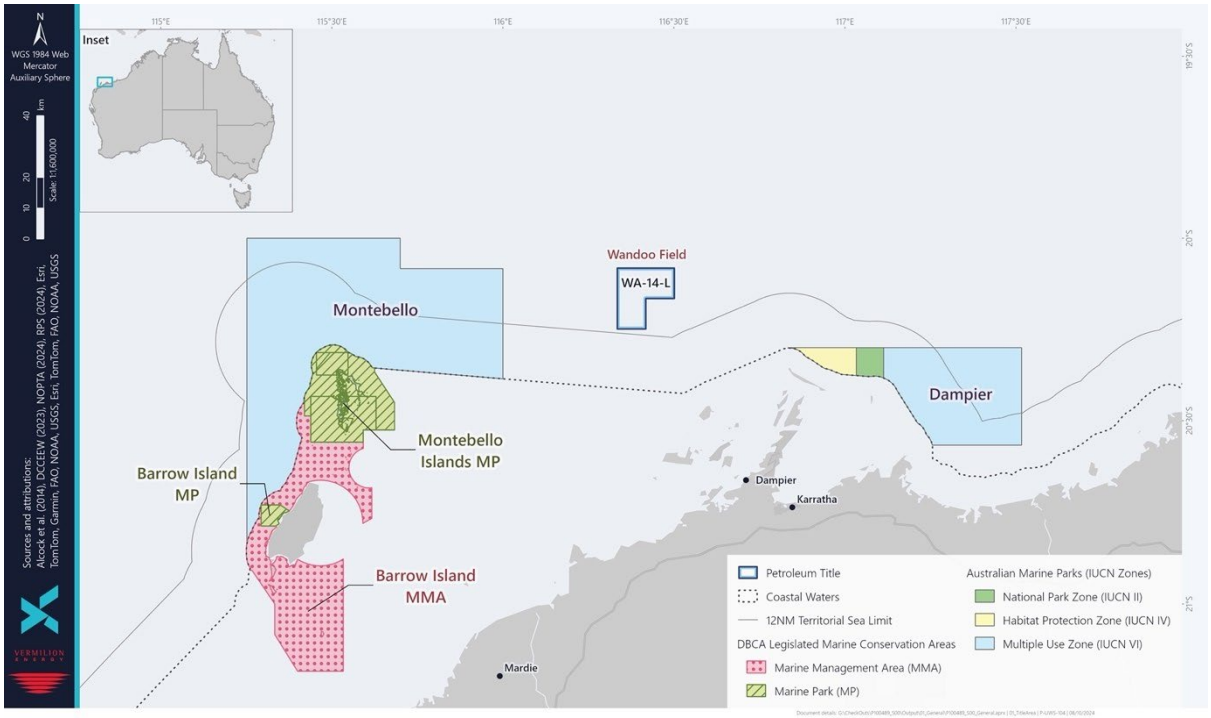
Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet KTLAAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from KTLAAC.

The purpose of this consultation is to give KTLAAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;

- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on KTLAAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.3. Email to Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC) on 9 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Nganhurra Thanardi Garrbu Aboriginal Corporation (**NTGAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Gnulli, Gnulli #2 and Gnulli #3 – Yinggarda, Baiyungu and Thalanyji Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the NTGAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How NTGAC would like to be contacted and engaged for consultation; and
2. If NTGAC has a requirement for a formalised consultation agreement to be in place, and if NTGAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the NTGAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EPs**); and
3. provide general information about Vermilion.

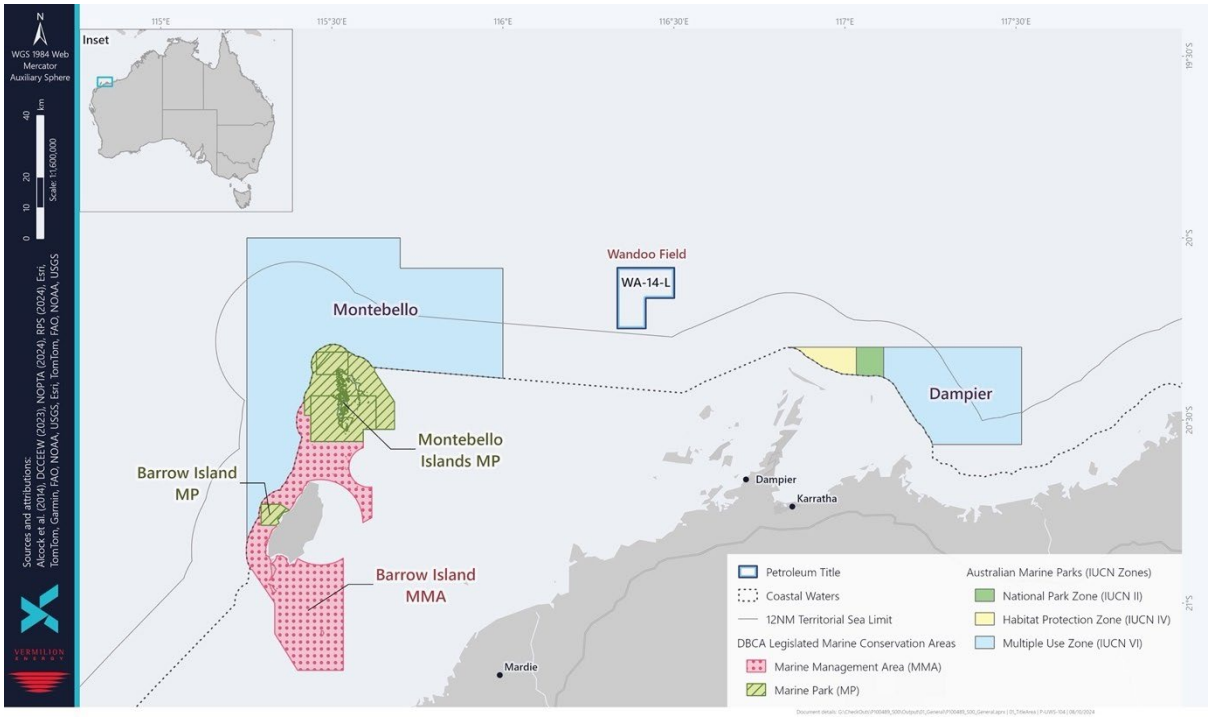
This is Vermilion's first consultation for an EP, and our client welcomes the engagement with NTGAC.

Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet NTGAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from NTGAC.

The purpose of this consultation is to give NTGAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;
- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on NTGAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.4. Email to Wirrawandi Aboriginal Corporation RNTBC (WAC) on 9 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Wirrawandi Aboriginal Corporation RNTBC (**WAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Yaburara & Mardudhunera Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the WAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo offshore oil field.

Vermilion requests advice on:

1. How WAC would like to be contacted and engaged for consultation; and
2. If WAC has a requirement for a formalised consultation agreement to be in place, and if WAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the WAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EPs**); and
3. provide general information about Vermilion.

This is Vermilion's first consultation for an EP, and our client welcomes the engagement with WAC.

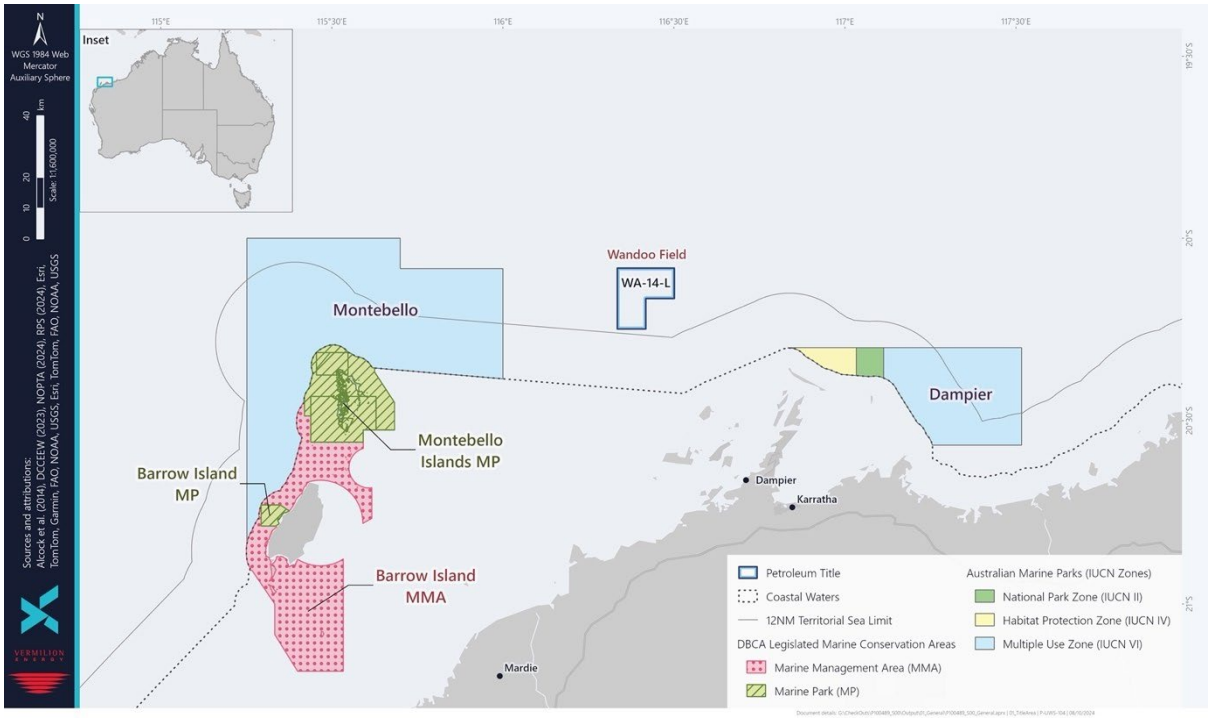
Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet WAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from WAC.

The purpose of this consultation is to give WAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;

- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on WAC's functions, interests, and activities.



Confidentiality and Information Sharing

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If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.5. Email to Ngarluma Aboriginal Corporation RNTBC (NAC) on 9 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Ngarluma Aboriginal Corporation RNTBC (**NAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Ngarluma Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the NAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How NAC would like to be contacted and engaged for consultation; and
2. If NAC has a requirement for a formalised consultation agreement to be in place, and if NAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the NAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EPs**); and
3. provide general information about Vermilion.

This is Vermilion's first consultation for an EP, and our client welcomes the engagement with NAC.

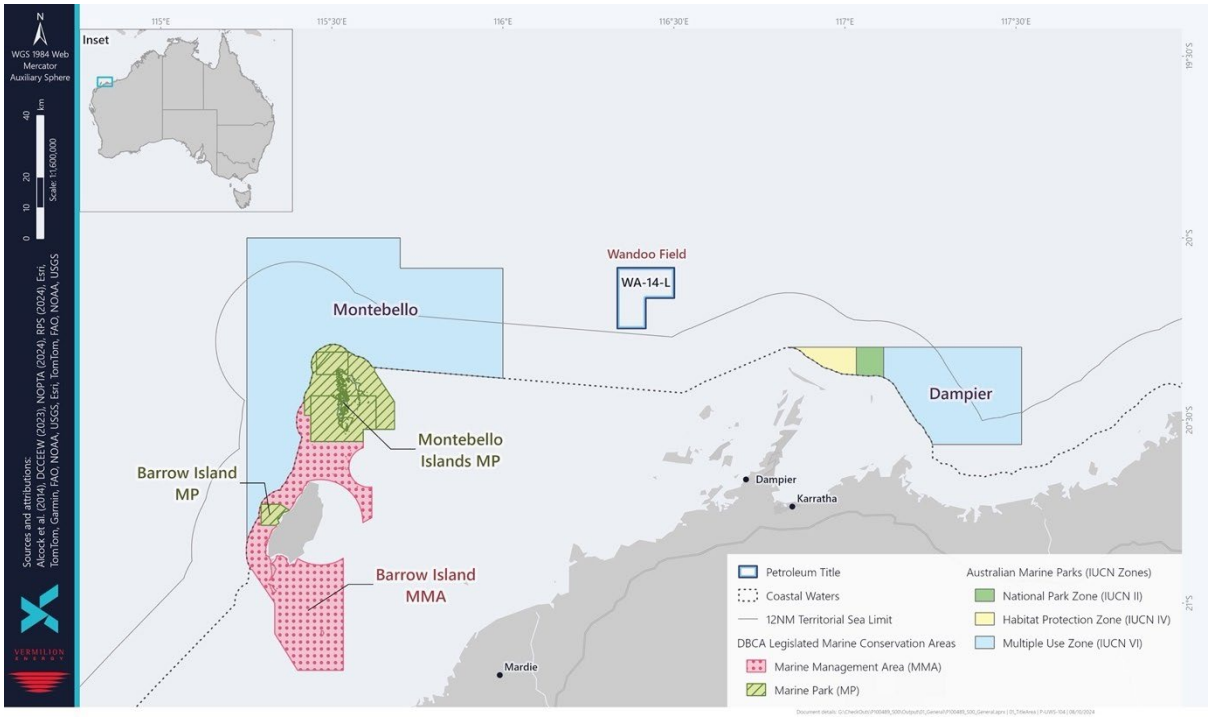
Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet NAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from NAC.

The purpose of this consultation is to give NAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;

- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on NAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.6. Email to Malgana Aboriginal Corporation (MAC) on 9 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Malgana Aboriginal Corporation (**MAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) are adjacent to the Malgana Part A native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the MAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How MAC would like to be contacted and engaged for consultation; and
2. If MAC has a requirement for a formalised consultation agreement to be in place, and if MAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the MAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EPs**); and
3. provide general information about Vermilion.

This is Vermilion's first consultation for an EP, and our client welcomes the engagement with MAC.

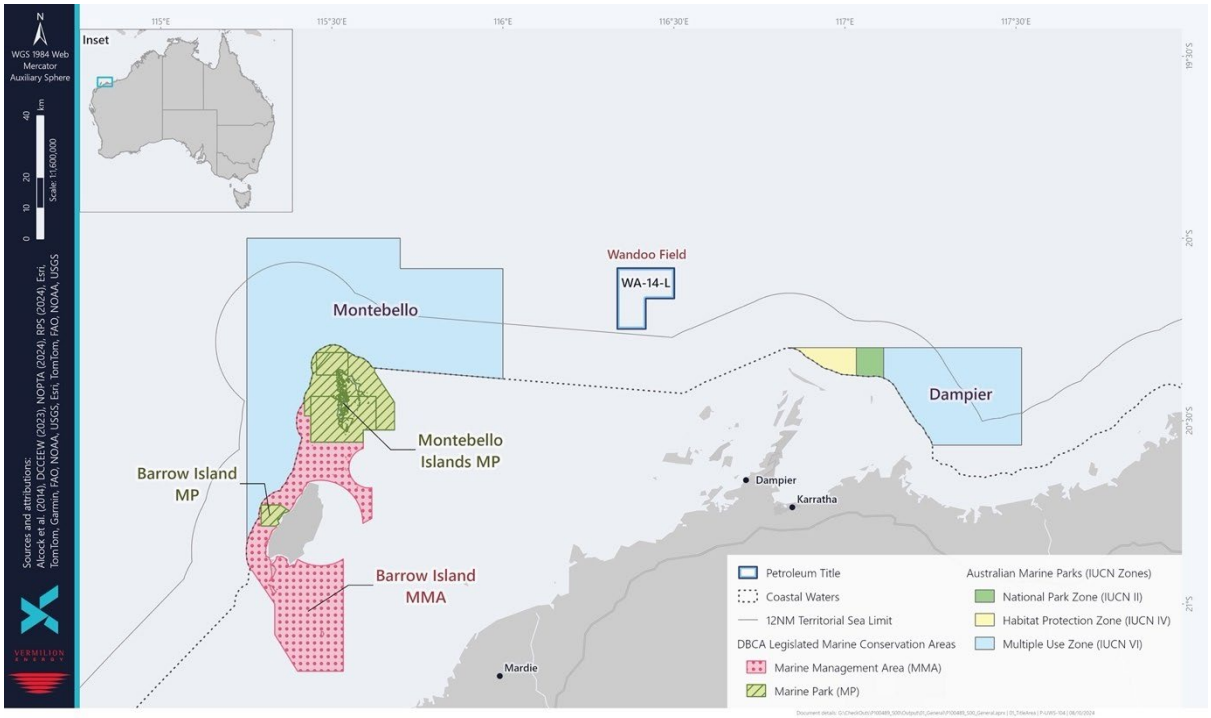
Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet MAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from MAC.

The purpose of this consultation is to give MAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;

- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on MAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.7. Email to Kariyarra Aboriginal Corporation RNTBC (KAC) on 10 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Kariyarra Aboriginal Corporation RNTBC (**KAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Kariyarra Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the KAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How KAC would like to be contacted and engaged for consultation; and
2. If KAC has a requirement for a formalised consultation agreement to be in place, and if KAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the KAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EPs**); and
3. provide general information about Vermilion.

This is Vermilion's first consultation for an EP, and our client welcomes the engagement with KAC.

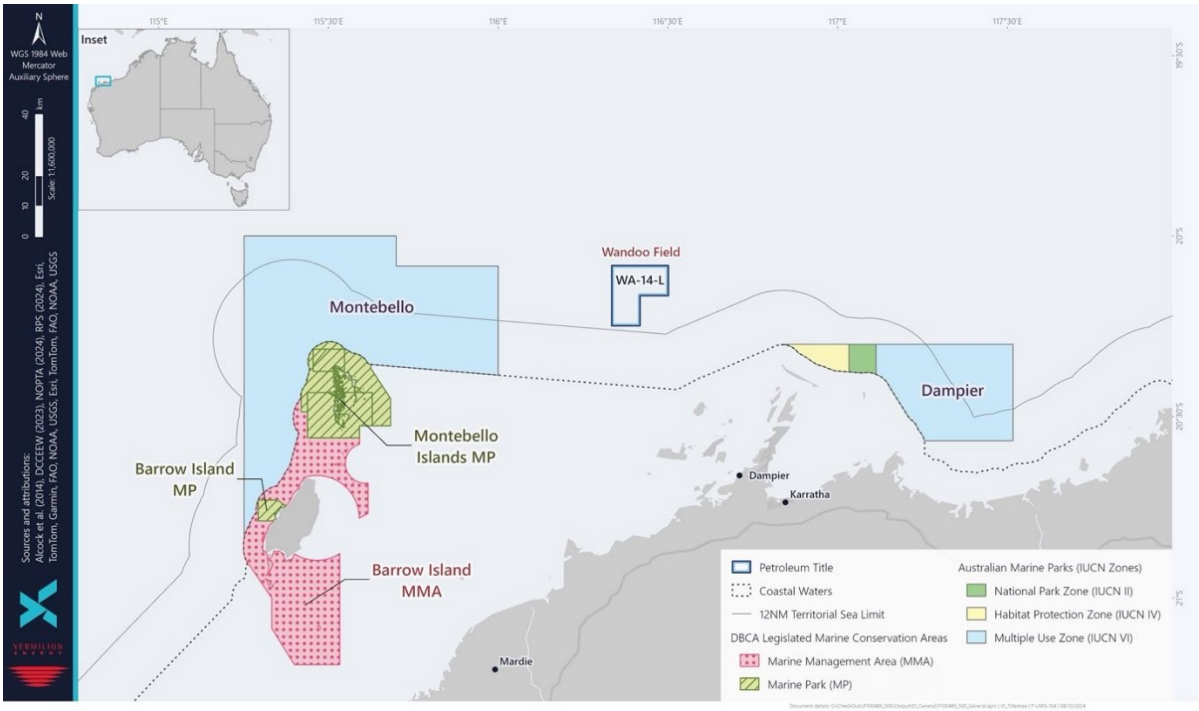
Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet KAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from KAC.

The purpose of this consultation is to give KAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;

- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on KAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.8. Email to Buurabalayji Thalanyji Aboriginal Corporation (BTAC) on 14 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Buurabalayji Thalanyji Aboriginal Corporation (**BTAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Thalanyji Peoples' native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the BTAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How BTAC would like to be contacted and engaged for consultation; and
2. If BTAC has a requirement for a formalised consultation agreement to be in place, and if BTAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the BTAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EP**s); and
3. provide general information about Vermilion.

This is Vermilion's first consultation for an EP, and our client welcomes the engagement with BTAC.

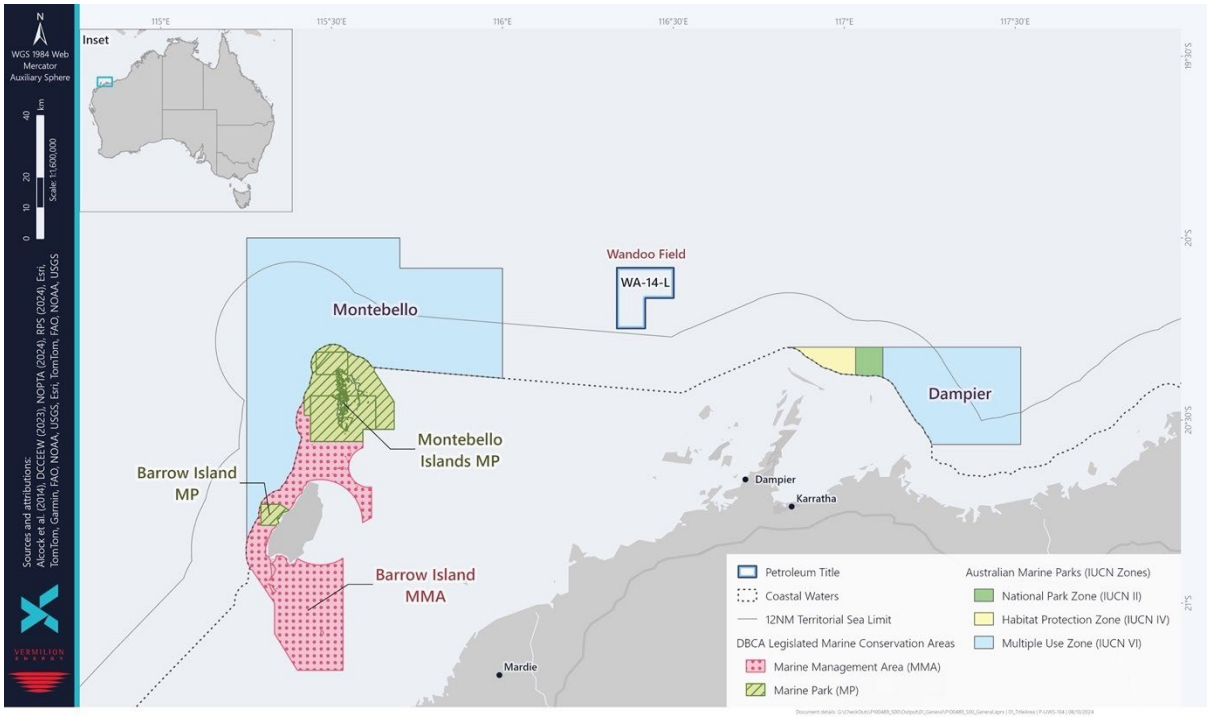
Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet BTAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from BTAC.

The purpose of this consultation is to give BTAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;

- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on BTAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.9. Email to Yindjibarndi Aboriginal Corporation (YAC) on 14 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Yindjibarndi Aboriginal Corporation (**YAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Yindjibarndi Peoples' native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the YAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How YAC would like to be contacted and engaged for consultation; and
2. If YAC has a requirement for a formalised consultation agreement to be in place, and if YAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the YAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EP**s); and
3. provide general information about Vermilion.

This is Vermilion's first consultation for an EP, and our client welcomes the engagement with YAC.

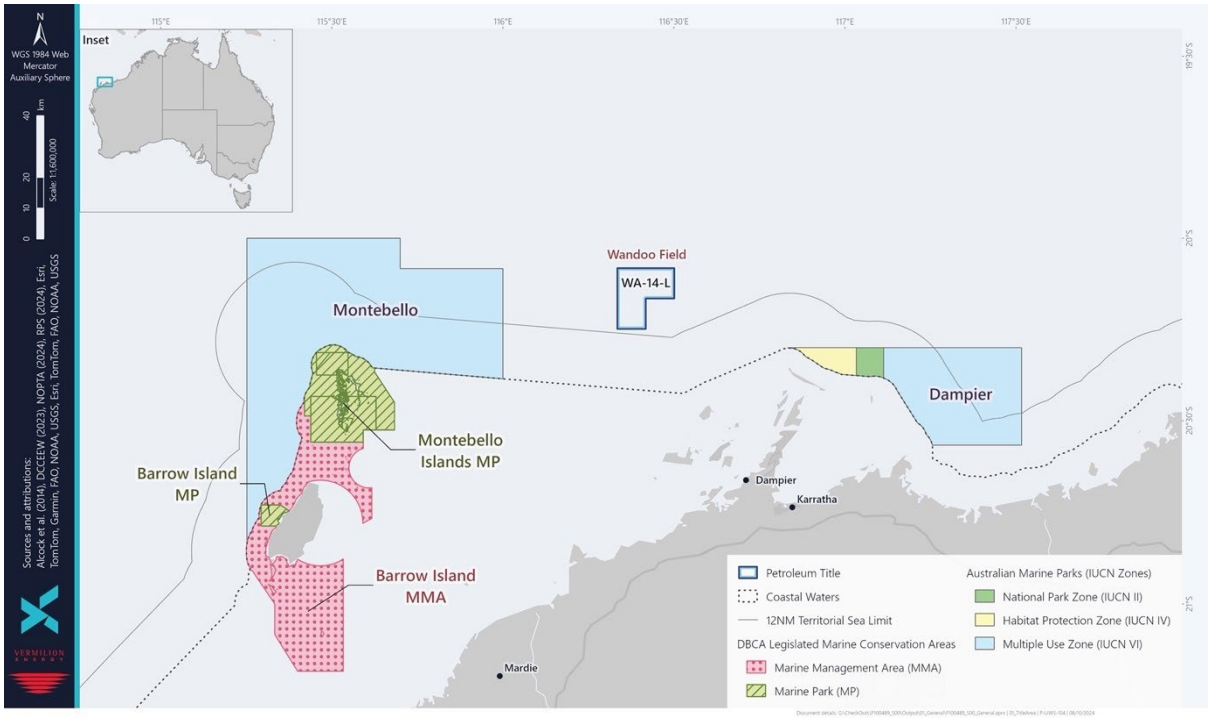
Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet YAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from YAC.

The purpose of this consultation is to give YAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;

- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on YAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.10. Email to Nyangumarta Karajarri Aboriginal Corporation RNTBC (NKAC) on 14 October 2024

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Nyangumarta Karajarri Aboriginal Corporation RNTBC (**NKAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Nyangumarta-Karajarri (Yawinya) Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with the NKAC as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How NKAC would like to be contacted and engaged for consultation; and
2. If NKAC has a requirement for a formalised consultation agreement to be in place, and if NKAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the NKAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EPs**); and
3. provide general information about Vermilion.

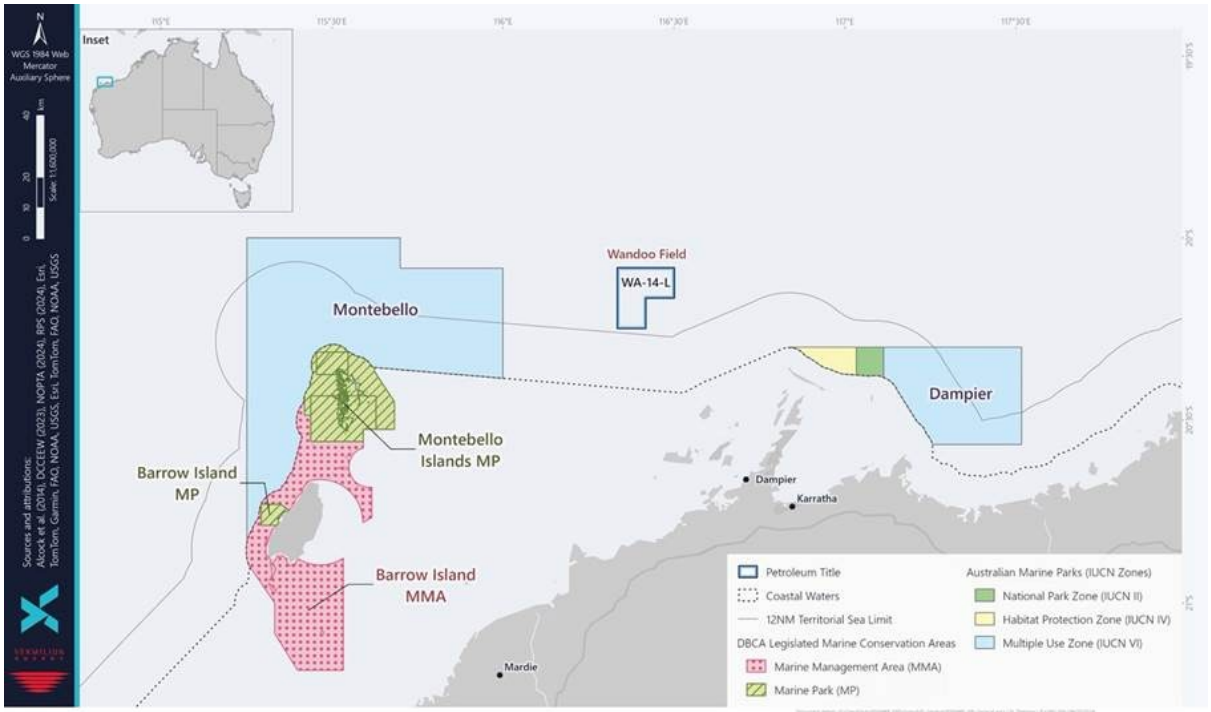
This is Vermilion's first consultation for an EP, and our client welcomes the engagement with NKAC.

Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet NKAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from NKAC.

The purpose of this consultation is to give NKAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;
- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on NKAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.11. Email to Nanda Aboriginal Corporation RNTBC (NAC) on 17 October 2024

Hi [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Nanda Aboriginal Corporation RNTBC (**NAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) that are adjacent to the Nanda Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with Yawuru as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How NAC would like to be contacted and engaged for consultation; and
2. If NAC has a requirement for a formalised consultation agreement to be in place, and if NAC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the NAC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EP**s); and
3. provide general information about Vermilion.

This is Vermilion's first consultation for an EP, and our client welcomes the engagement with NAC.

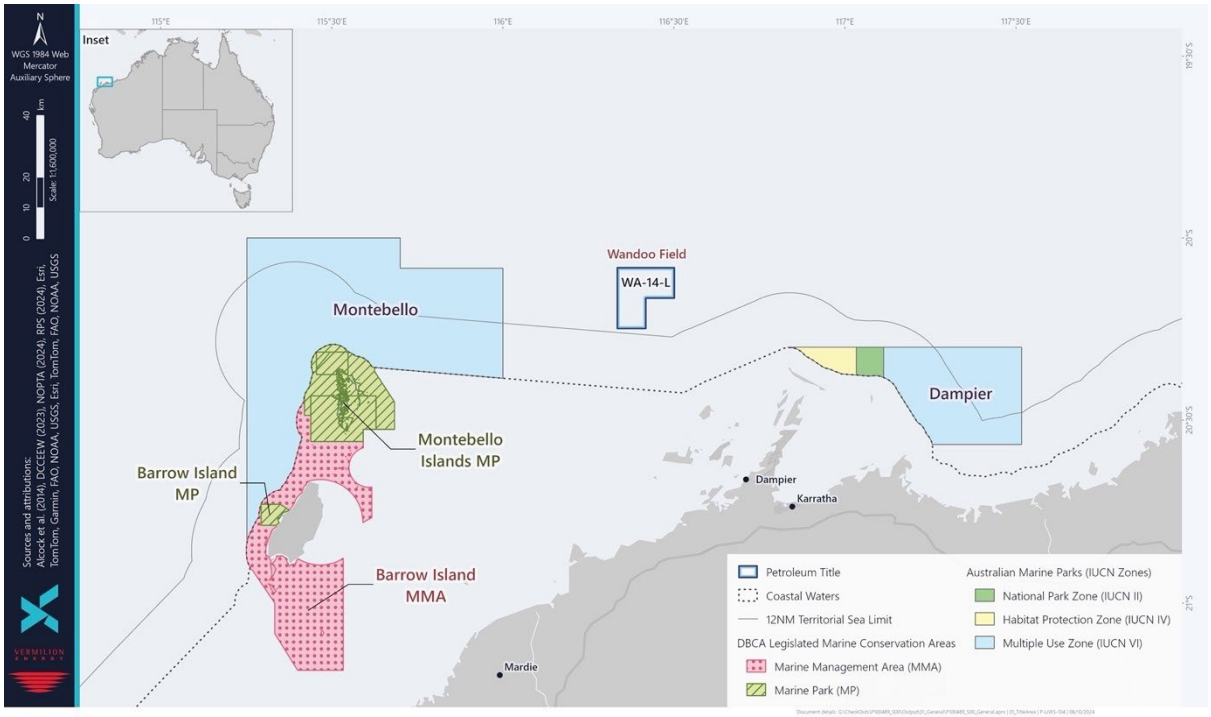
Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet NAC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from NAC.

The purpose of this consultation is to give NAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;

- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on NAC's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

2.12. Email to Nyangumarta Warrarn Aboriginal Corporation RNTBC (Nyangumarta Warrarn AC) (NWAC) on 17 October 2024

Hi [redacted]

How are you? I no longer have your phone number.

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Nyangumarta Warrarn Aboriginal Corporation RNTBC (**Nyangumarta Warrarn AC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) overlaps the Nyangumarta Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with Yawuru as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How Nyangumarta Warrarn AC would like to be contacted and engaged for consultation; and
2. If Yawuru has a requirement for a formalised consultation agreement to be in place, and if Nyangumarta Warrarn AC can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the Nyangumarta Warrarn AC Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EP**s); and
3. provide general information about Vermilion.

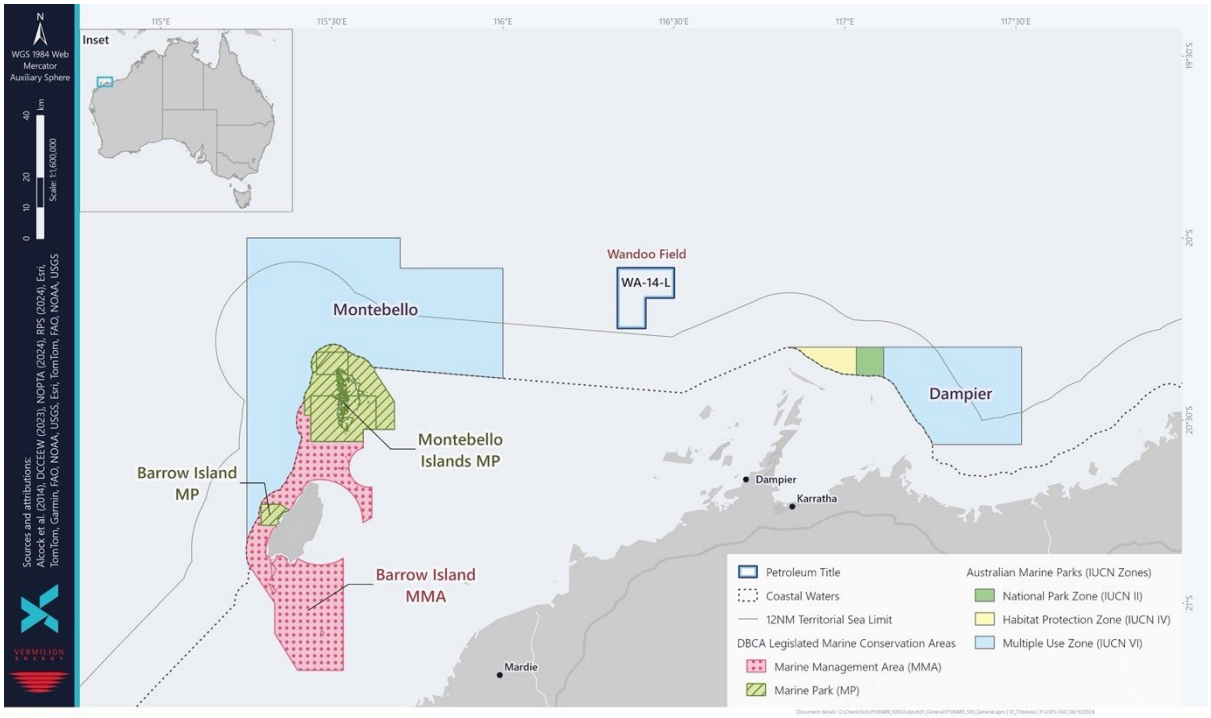
This is Vermilion's first consultation for an EP, and our client welcomes the engagement with Nyangumarta Warrarn AC.

Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet Nyangumarta Warrarn AC's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from Nyangumarta Warrarn AC.

The purpose of this consultation is to give Nyangumarta Warrarn AC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;
- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on Yawuru's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Please do give me a call on 0401 499 379

Regards

2.13. Email to Yawuru Native Title Holders Aboriginal Corporation RNTBC (Yawuru) (YNTHAC) on 17 October 2024

Hi [redacted]

I trust that this finds you well, I spoke now with your reception, and was advised you were the best person to contact.

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Yawuru Native Title Holders Aboriginal Corporation RNTBC (**Yawuru**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field.

- The planning area for those activities (particularly the 'environment that may be affected' (**EMBA**)) is adjacent the Yawuru Peoples native title determination (**Native Title Holders**)
- Vermilion believes that Native Title Holders might be relevant for participating in consultation as part of the environmental planning process.

Vermilion recognises the importance of cultural heritage to the Native Title Holders and are committed to ensuring that these values are respected and integrated into their project planning. If Native Title Holders would like to participate in the process, Vermilion is interested in building a relationship and consulting with Yawuru as the representatives for the Native Title Holders regarding upcoming proposed activities in the Wandoo Offshore Oil Field.

Vermilion requests advice on:

1. How Yawuru would like to be contacted and engaged for consultation; and
2. If Yawuru has a requirement for a formalised consultation agreement to be in place, and if Yawuru can provide this documentation to Vermilion.

Vermilion would like to offer a meeting with the Yawuru Board, to:

1. provide background on the planned activities;
2. engage in consultation regarding the proposed Environment Plans (**EP**s); and
3. provide general information about Vermilion.

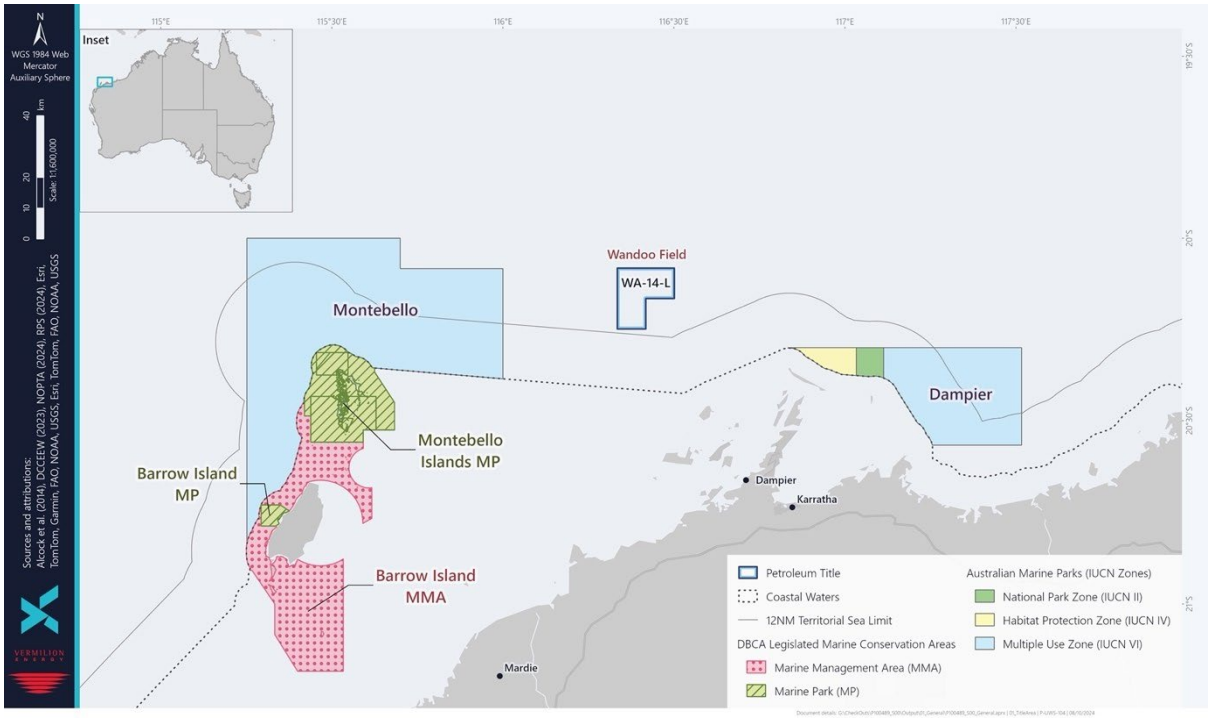
This is Vermilion's first consultation for an EP, and our client welcomes the engagement with Yawuru.

Seeking your input

Vermilion wants to make sure that the engagement is tailored to meet Yawuru's needs and proposes to engage with a co-design approach where the agenda for any meeting is mutually agreed and includes input from Yawuru.

The purpose of this consultation is to give Yawuru the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;
- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on Yawuru's functions, interests, and activities.



Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion Oil and Gas Australia and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

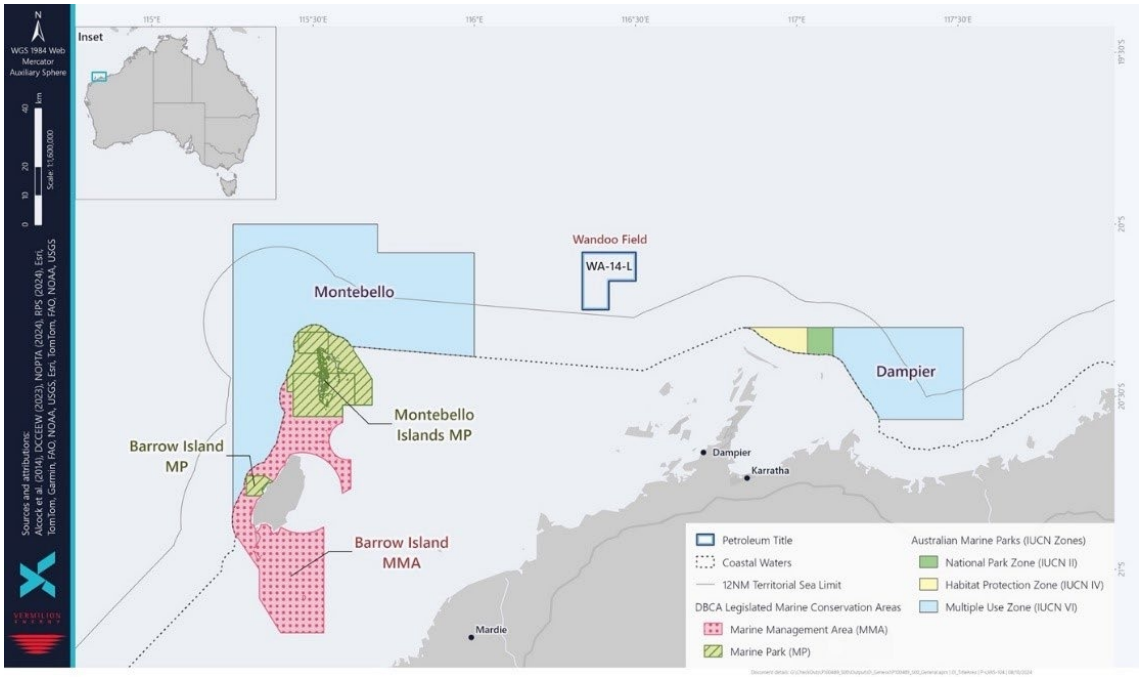
Regards

2.14. Email to Commonwealth Fisheries Association (CFA) on 13 November 2024

Dear Commonwealth Fisheries Association

I am contacting you on behalf of Vermilion Oil and Gas Australia (**Vermilion**), which has operations in the Wandoo Offshore Oil Field located approximately 80km northwest of Dampier and 110km northeast of Barrow Island.

The Wandoo Facility is located in Commonwealth waters within the Carnarvon Basin and operates at a water depth of 50-60m. More information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L'.



Seeking your input

We are contacting Commonwealth Fisheries Association (CFA) because Vermilion has upcoming proposed activities in the Wandoo Field.

The purpose of this email is to seek your input on your preferred method of consultation, where CFA is considered a relevant person for consultation on Vermilion's proposed activities.

Specifically, where Commonwealth commercial fisheries are identified as a relevant person for consultation on Vermilion's proposed activities, is there a preferred method for consultation with respective licence holders?

We want to make sure that the consultation engagement is appropriate and tailored to meet the needs of the commonwealth commercial fisheries participants and provides you with the opportunity to contribute in line with your functions, interests, or activities as we believe this is our first consultation with CFA for our Environment Plans.

Confidentiality and information sharing

Information gathered during consultation will be recorded by Vermilion and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

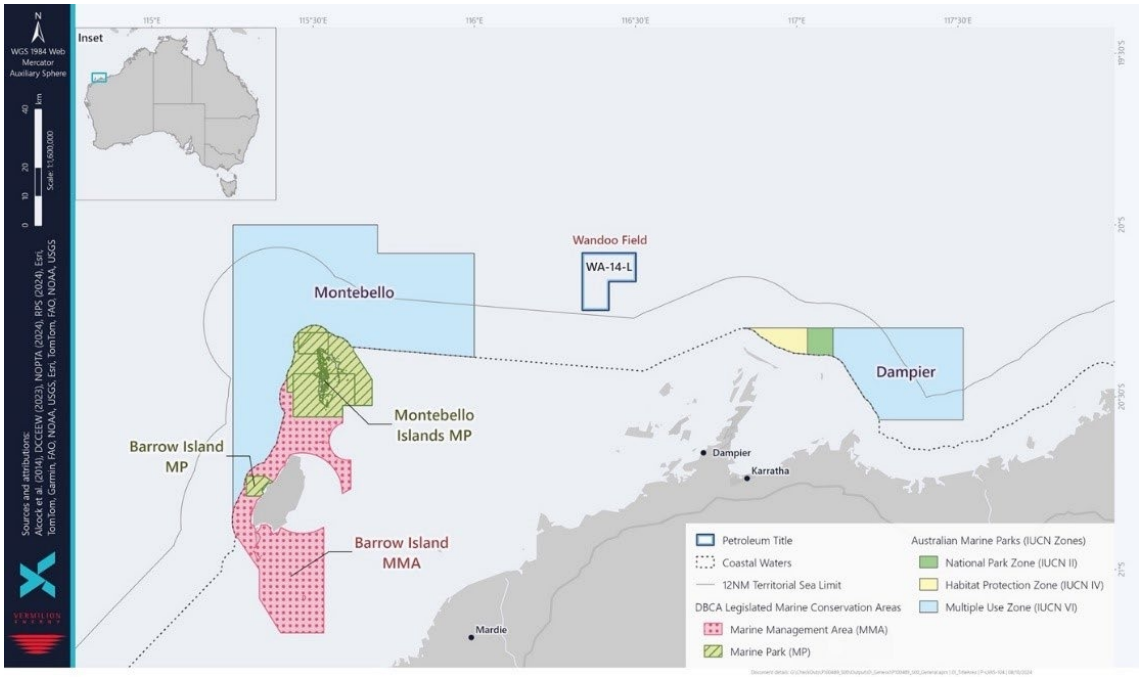
Regards ,

2.15. Email to Pearl Producers Association (PPA) on 13 November 2024

Dear Pearl Producers Association

I am contacting you on behalf of Vermilion Oil and Gas Australia (**Vermilion**), which has operations in the Wandoo Offshore Oil Field located approximately 80km northwest of Dampier and 110km northeast of Barrow Island.

The Wandoo Facility is located in Commonwealth waters within the Carnarvon Basin and operates at a water depth of 50-60m. More information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L'.



Seeking your input

We are contacting Pearl Producers Association (PPA) because Vermilion has upcoming proposed activities in the Wandoo Field.

The purpose of this email is to seek your input on your preferred method of consultation, where PPA is considered a relevant person for consultation on Vermilion's proposed activities.

Specifically, where Pearl Oyster Managed Fishery in Western Australia is identified as a relevant person for consultation on Vermilion's proposed activities, is there a preferred method for consultation with respective licence holders? We are currently exploring consultation with Pearl Oyster Managed Fishery via the Western Australian Fishing Industry Council (WAFIC).

We want to make sure that the consultation engagement is appropriate and tailored to meet the needs of commercial fisheries participants and provides you with the opportunity to contribute in line with your functions, interests, or activities as we believe this is our first consultation with PPA for our Environment Plans.

Confidentiality and information sharing

Information gathered during consultation will be recorded by Vermilion and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

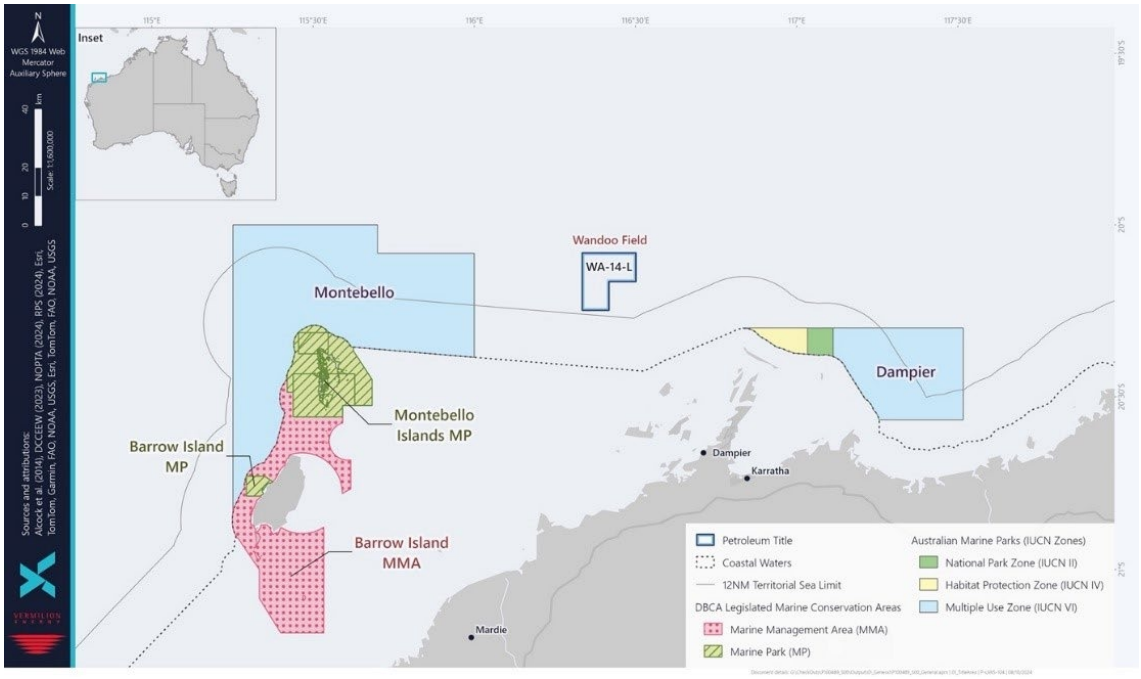
Regards ,

2.16. Email to Western Rock Lobster Council on 13 November 2024

Dear Western Rock Lobster Council

I am contacting you on behalf of Vermilion Oil and Gas Australia (**Vermilion**), which has operations in the Wandoo Offshore Oil Field located approximately 80km northwest of Dampier and 110km northeast of Barrow Island.

The Wandoo Facility is located in Commonwealth waters within the Carnarvon Basin and operates at a water depth of 50-60m. More information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L'.



Seeking your input

We are contacting Western Rock Lobster Council because Vermilion has upcoming proposed activities in the Wandoo Field.

The purpose of this email is to seek your input on your preferred method of consultation, where Western Rock Lobster Council is considered a relevant person for consultation on Vermilion's proposed activities.

Specifically, where West Coast Rock Lobster Managed Fishery in Western Australia is identified as a relevant person for consultation on Vermilion's proposed activities, is there a preferred method for consultation with respective licence holders? We are currently exploring consultation with West Coast Rock Lobster Managed Fishery via the Western Australian Fishing Industry Council (WAFIC).

We want to make sure that the consultation engagement is appropriate and tailored to meet the needs of commercial fisheries participants and provides you with the opportunity to contribute in line with your functions, interests, or activities as we believe this is our first consultation with Western Rock Lobster Council for our Environment Plans.

Confidentiality and information sharing

Information gathered during consultation will be recorded by Vermilion and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

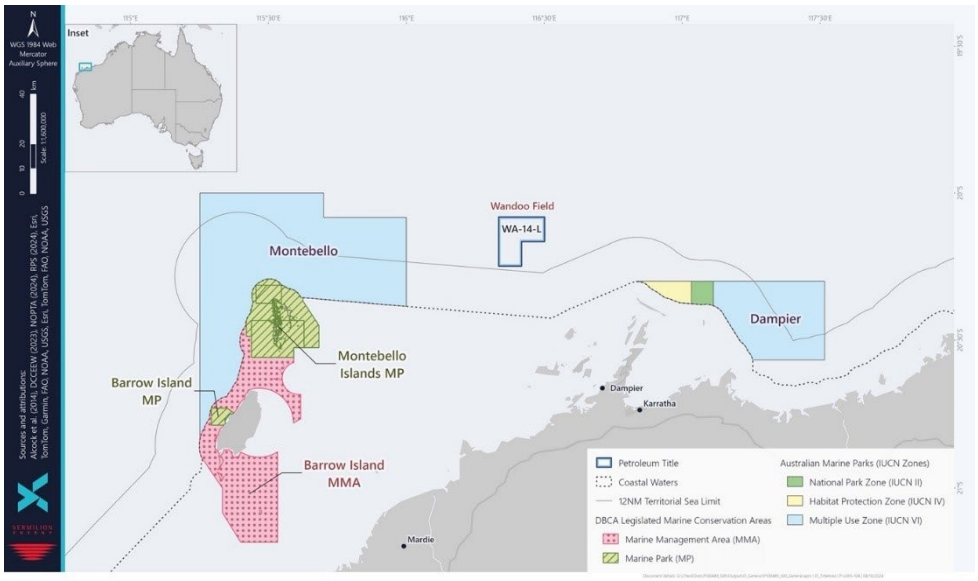
Regards ,

2.17. Email to Recfishwest on 13 November 2024

Dear Recfishwest

I am contacting you on behalf of Vermilion Oil and Gas Australia (**Vermilion**), which has operations in the Wandoo Offshore Oil Field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island.

The Wandoo Facility is located in Commonwealth waters within the Carnarvon Basin and operates at a water depth of 50-60m. More information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L'.



Seeking your input

We are contacting Recfishwest because Vermilion has upcoming proposed activities in the Wandoo Field.

The purpose of this email is to seek your input on your preferred method of consultation, where Recfishwest is considered a relevant person for consultation on Vermilion's proposed activities.

We want to make sure that the consultation engagement is appropriate and tailored to meet the needs of the recreational fishing sector and provides you with the opportunity to contribute in line with your interests, functions or activities as we believe this is our first consultation with Recfishwest for our Environment Plans.

Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

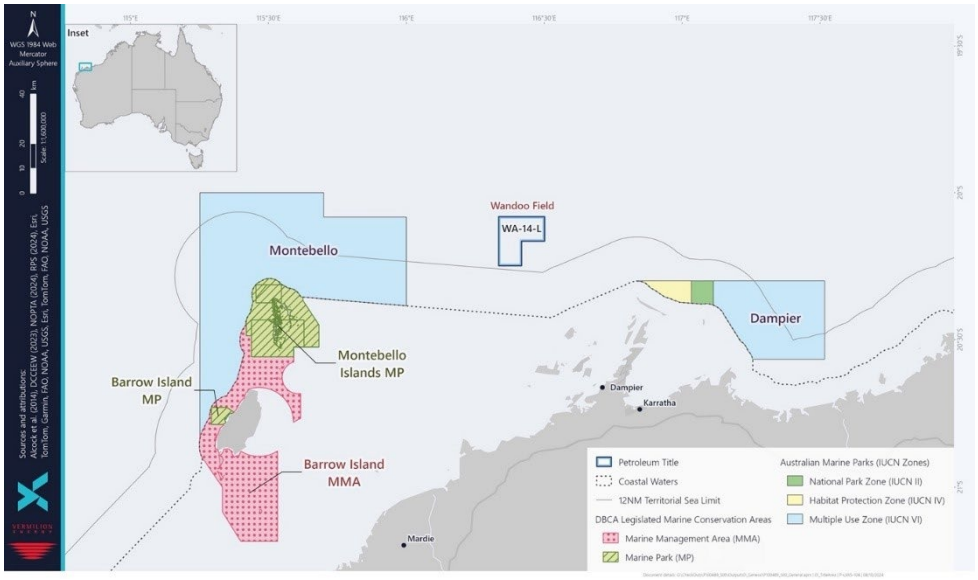
Regards

2.18. Email to Marine Tourism WA on 14 November 2024

Dear Marine Tourism WA

I am contacting you on behalf of Vermilion Oil and Gas Australia (**Vermilion**), which has operations in the Wandoo Offshore Oil Field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island.

The Wandoo Facility is located in Commonwealth waters within the Carnarvon Basin and operates at a water depth of 50-60m. More information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L'.



Seeking your input

We are contacting Marine Tourism WA because Vermilion has upcoming proposed activities in the Wandoo Field.

The purpose of this email is to seek your input on your preferred method of consultation, where Marine Tourism WA is considered a relevant person for consultation on Vermilion's proposed activities.

We want to make sure that the consultation engagement is appropriate and tailored to meet the needs of the charter boating industry and provides you with the opportunity to contribute in line with your interests, functions or activities as we believe this is our first consultation with Marine Tourism WA for our Environment Plans.

Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

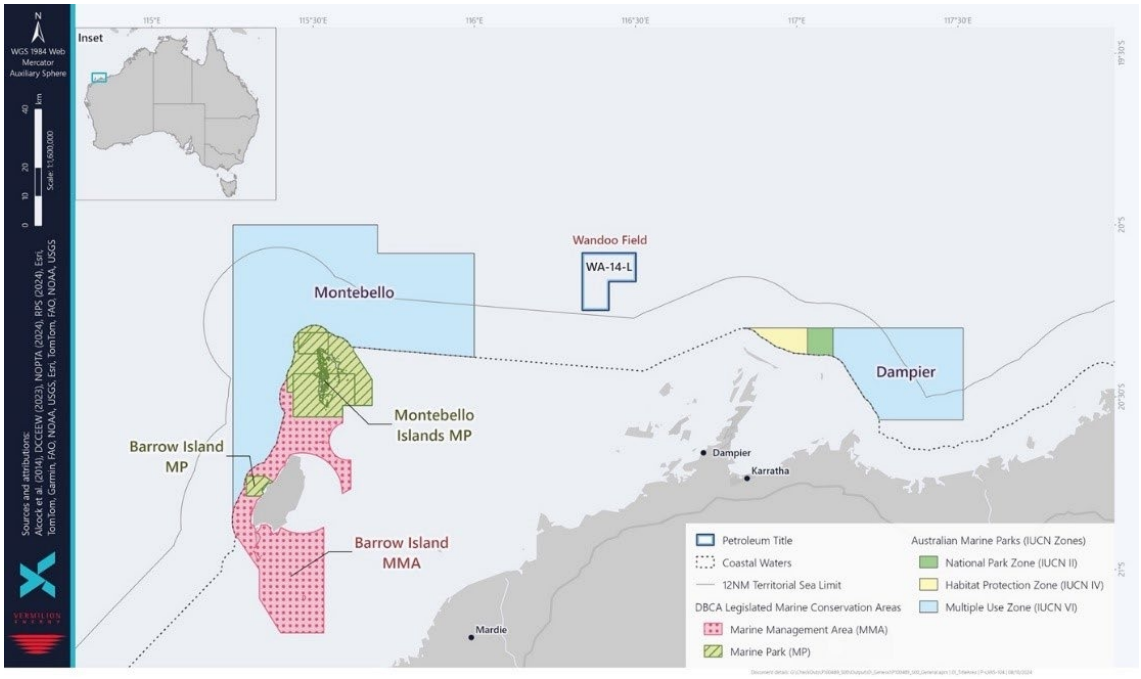
Regards

2.19. Email to Australian Fisheries Management Authority (AFMA) on 14 November 2024

Dear Australian Fisheries Management Authority

I am contacting you on behalf of Vermilion Oil and Gas Australia (**Vermilion**), which has operations in the Wandoo Offshore Oil Field located approximately 80km northwest of Dampier and 110km northeast of Barrow Island.

The Wandoo Facility is located in Commonwealth waters within the Carnarvon Basin and operates at a water depth of 50-60m. More information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L'.



Seeking your input

We are contacting the Australian Fisheries Management Authority (AFMA) because Vermilion has upcoming proposed activities in the Wandoo Field.

The purpose of this email is to seek your input on your preferred method of consultation, where AFMA is considered a relevant person for consultation on Vermilion's proposed activities.

Specifically, where Commonwealth commercial fisheries are identified as a relevant person for consultation on Vermilion's proposed activities, is there a preferred method for consultation with respective licence holders?

We want to make sure that the consultation engagement is appropriate and tailored to meet the needs of the commonwealth commercial fisheries participants and provides you with the opportunity to contribute in line with your functions, interests, or activities.

Confidentiality and information sharing

Information gathered during consultation will be recorded by Vermilion and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

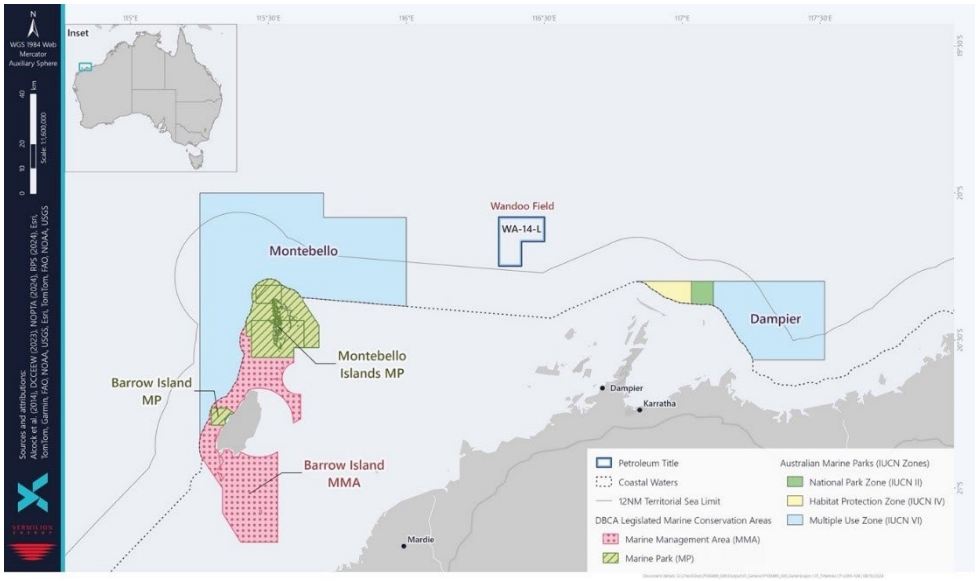
Regards ,

2.20. Email to WA Game Fishing Association (WAGFA) on 14 November 2024

Dear WA Game Fishing Association

I am contacting you on behalf of Vermilion Oil and Gas Australia (**Vermilion**), which has operations in the Wandoo Offshore Oil Field located approximately 80km northwest of Dampier and 110km northeast of Barrow Island.

The Wandoo Facility is located in Commonwealth waters within the Carnarvon Basin and operates at a water depth of 50-60m. More information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and a map of the title area is included below, shown on the map as 'Wandoo Field WA-14-L'.



Seeking your input

We are contacting WA Game Fishing Association because Vermilion has upcoming proposed activities in the Wandoo Field.

The purpose of this email is to seek your input on your preferred method of consultation, where WA Game Fishing Association is considered a relevant person for consultation on Vermilion's proposed activities.

We want to make sure that the consultation engagement is appropriate and tailored to meet the needs of the recreational fishing sector and provides you with the opportunity to contribute in line with your interests, functions or activities as we believe this is our first consultation with WA Game Fishing Association for our Environment Plans.

Confidentiality and Information Sharing

Information gathered during consultation will be recorded by Vermilion and documented within any submission to the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) for assessment. You may request that specific information you provide not be publicly published. In such a case, Vermilion will retain the information securely and in confidence.

If you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond to this email or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

3. Consultation – December 2024

3.1. Email to Australian Border Force (ABF) (Maritime Border Command), Department of Energy, Mines, Industry Regulation and Safety (DEMIRS), Department of Industry, Science and Resources (DISR), Department of Biodiversity, Conservation and Attractions (DBCA), Department of Transport (DoT) – marine pollution, Ningaloo Coast World Heritage Advisory Committee (NCWHAC), Pilbara Development Commission (PDC), Pilbara Ports Authority (PPA), Protect Ningaloo, Australian Conservation Foundation (ACF), The Conservation Council of WA (CCWA), Care for Hedland on 2 December 2024

Dear Stakeholder

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.2. Email to Australian Fisheries Management Authority (AFMA) on 2 December 2024

Dear AFMA,

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Information for the commercial fishing sector

Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheets attached.

We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.

Information about exclusionary zones and communication with fishers and mariners are inlcuded in the attached docments.

Vermilion acknowledges AFMA's consultation guidance to consult with fishing industry associations directly and has applied this by consulting with the relevant fishing industry

associations for commercial fisheries identified as having potential for interaction in the operational area and EMBA.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.3. Email to Western Australian Fishing Industry Council (WAFIC) on 2 December 2024

Dear WAFIC,

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Information for the commercial fishing sector

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.
- Information about exclusionary zones and communication with fishers and mariners are inlcuded in the attached docments.

Vermilion acknowledges WAFIC's consultation guidance and has applied this by consulting fisheries assessed as having a potential for interaction in the Operational Areas and EMBA via WAFIC.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.4. Email to Western Australian Fishing Industry Council (WAFIC) on 2 December 2024

Dear [redacted]

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

As the peak industry body representing the interests of the commercial fishing sector, Vermilion would like to enter into a fee-for-service engagement – Option A with WAFIC.

As required, we have attached all the necessary information that is listed in your consultation framework so that we can commence engagement with the relevant fishers, with information sheets attached (generic and commercial fisher specific). Please let me know if you require anything further.

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.
- Information about exclusionary zones and communication with fishers and mariners are included in the attached documents.

Can you please also advise if you will invoice us directly?

I look forward to hearing from you.

3.5. Email to Australian Southern Bluefin Tuna Fishery Association (ASBITA), Commonwealth Fisheries Association (CFA), Pearl Producers Association (PPA), Seafood Industry Australia (SIA), Tuna Australia (TA), Western Rock Lobster Council (WRLC) on 2 December 2024

Dear Commercial Fishing Representative Body

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Information for the commercial fishing sector

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.
- Information about exclusionary zones and communication with fishers and mariners are included in the attached documents.

- Vermilion acknowledges WAFIC's consultation guidance and has applied this by consulting fisheries assessed as having a potential for interaction in the Operational Areas and EMBA via WAFIC. Vermilion has also consulted with AFMA.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.6. Email to WA Game Fishing Association (WAGFA), Recfishwest, Marine Tourism WA, Ashburton Anglers, Exmouth Game Fishing Club (EGFC), King Bay Game Fishing Club (KBFC), Nickol Bay Sportsfishing Club (NBSC) on 2 December 2024

Dear Stakeholder

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.7. Email to Australian Hydrographic Office (AHO), Australian Maritime Safety Authority (AMSA) – maritime safety, Australian Maritime Safety Authority (AMSA) – marine pollution on 2 December 2024

Dear AMSA and AHO

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here. **A shipping lane map is also attached.**

Seeking your input

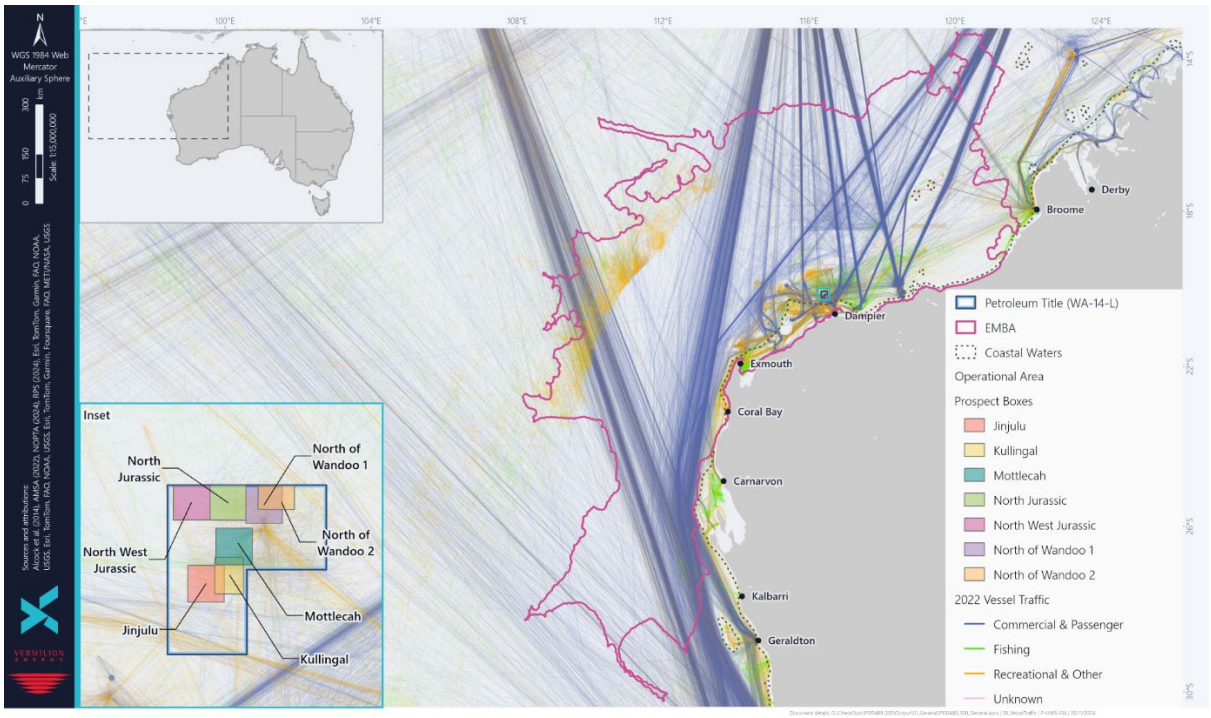
If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.7.1. Shipping lane map sent to Australian Hydrographic Office (AHO), Australian Maritime Safety Authority (AMSA) – maritime safety, Australian Maritime Safety Authority (AMSA) – marine pollution on 2 December 2024



3.8. Email to Director of National Parks (DNP) on 2 December 2024

Dear Director of National Parks,

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

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Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Australian Marine Parks (AMPs)

We note Australian Government Guidance on consultation activities and confirm that:

- No Australian Marine Parks (AMPs) are within the Operational Area. The nearest AMPs are:
    - Montebello AMP ~37km to the west of the Operational Area.
    - Dampier AMP ~47km to the south east of the Operational Area.
    - Montebello Islands Marine Part (State) ~ 75km to the west-south west of the Operational Area.
    - Barrow Island Marine Management Area (State) ~89km to the west-south west of the Operational Area.
- We have assessed potential risks to AMPs in the development of the proposed Environment Plans and believe that there are no credible risks as part of planned activities that have potential to impact the values of the AMPs.
- The worst-case credible spill scenario assessed in the Wandoo Field Exploration Drilling Environment Plan is the highly unlikely event of a loss of well containment resulting in the release of reservoir hydrocarbons to the marine environment.

- There are four AMPs listed within the EMBA.
- Through review of hydrocarbon spill modelling, and with consideration of a 50 ppb dissolved and 100 ppb entrained hydrocarbon threshold, the following AMPs may be contacted in the event of a spill:
    - Dampier
    - Gascoyne
    - Montebello, and
    - Ningaloo.

A NOPSEMA-approved oil spill response plan will be in place for the duration of the activities, which will include notification to relevant agencies and organisations as to the nature and scale of the event, as soon as practicable following an occurrence. The Director of National Parks will be advised if an environmental incident occurs that may impact on the values of the AMP.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

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Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.9. Email to Department of Primary Industries and Regional Development (DPIRD) – Fisheries on 2 December 2024

Dear DPIRD,

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Information for the commercial fishing sector

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.
- Information about exclusionary zones and communication with fishers and mariners are included in the attached documents.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but

not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.10. Email to Department of Defence (DoD) on 2 December 2024

Dear Department of Defence

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a

mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Defence

Vermilion has assessed all impacts and risks to Defence:

Wandoo Field Exploration Drilling Environment Plan: There are no Defence related uses within the Operational Area. The EMBA encompasses the military installations near Exmouth, including a naval communication station. The Department of Defence has several offshore training areas including the North West Exercise Area (NWXA) (approximately 95 km southwest of the Operational Area) and Learmonth Air Weapons Range (approximately 275 km west-southwest of the Operational Area) in the EMBA. These areas are used for Defence Force training exercises, including live firing. No unexploded ordnance (UXO) potential has been identified within the Operational Area.

Wandoo Field Geophysical and Geotechnical Environment Plan: There are no Defence related uses within the Operational Area. The EMBA encompasses the military installations near Exmouth, including a naval communication station. The Department of Defence has several offshore training areas including the North West Exercise Area (NWXA) (approximately 155 km southwest of the Operational Area) and Learmonth Air Weapons Range (approximately 330 km west-southwest of the Operational Area) in the EMBA. These areas are used for Defence Force training exercises, including live firing. No unexploded ordnance (UXO) potential has been identified within the Operational Area.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.11. Email to Australian Energy Producers (AEP) on 2 December 2024

Dear Australian Energy Producers

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for

the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Vermilion is consulting with energy industry titleholders and operators directly.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

3.12. Email to Curtin University (Centre for Marine Science and Technology), University of Western Australia (UWA), Commonwealth Scientific and Industrial Research Organisation (CSIRO), Western Australian Marine Science Institution (WAMSI), Australian Institute of Marine Science (AIMS), Australian Marine Sciences Association (WA Branch) on 2 December 2024

Dear Research Institute

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Vermilion is also seeking your advice regarding any research activities that your instiution/organisation is undertaking that may overlap with our proposed activities.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.13. Email to Department of Agriculture, Forestry and Fisheries (DAFF) – Fisheries on 3 December 2024

Dear DAFF - Fisheries

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Information for the commercial fishing sector

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.
- Information about exclusionary zones and communication with fishers and mariners are included in the attached documents.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but

not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Also attached are consultation information sheets specific to the commercial fishing sector. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.14. Email to Department of Agriculture, Forestry and Fisheries (DAFF) – Biosecurity (marine pests) (vessels, aircraft and personnel) on 3 December 2024

Dear DAFF – Biosecurity

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is

required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Also attached are consultation information sheets specific to the commercial fishing sector. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Biosecurity

With respect to the biosecurity matters, please note the following information below outlines our proposed biosecurity risk management to prevent the introduction of invasive marine species:

Environment Description and Assessment

The Operational Area is located in a deep-water (50-60 m) open-ocean environment that is ~63 km (34 nm) from the nearest shoreline and has a lack of hard substrate. Values and sensitivities of benthic habitats and communities within the Operational Area are limited to soft sediment benthic habitats that are widespread and homogenous in the North West Shelf (NWS). ROV surveys on the NWS, at similar water depths to those in the Operational Area, have indicated the seafloor is comprised of fine silt/sand substrates and benthic communities were generally sparse with low densities of organisms (e.g. crustaceans, molluscs, and polychaetes). Further, no key ecological features, often associated with provided hard substrate habitats are located within the Operational Area. Therefore, it is considered that the Operational Area does not provide a location conducive to marine pest establishment and survival, and that there is little potential for invasive organisms to accumulate and multiply. Displacement of native marine species or a reduction in abundance from predation, competition or interspecies breeding is not expected to occur.
Invasive Marine Species Prevention Controls

• Vessels will have an approved ballast water management plan and valid ballast water management certificate, unless an exemption applies or is obtained, as specified in the Australian Ballast Water Management Requirements.
• Vessels will complete a VOGA Biofouling Risk Assessment, identifying a low risk before mobilisation to the Operational Area:
  ○ Biofouling risk based on a range of information including presence of a biofouling management plan and record book, last port of call, age of anti-fouling coating etc. If a risk category of moderate, uncertain or high is scored, the process requires an independent IMS expert to be engaged and further risk assessment and/or management measures undertaken.
• Anti-fouling Systems on vessels are maintained in compliance with International Convention on the Control of Harmful Anti-Fouling Systems on Ships (IMO, 2001):
  ○ Prohibits the use of harmful organotins in antifouling paints used on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.

Yours sincerely

3.15. Email to Department of Climate Change, Energy, the Environment and Water (DCCEEW) – Underwater Cultural Heritage (UCH) on 3 December 2024

Dear DCCEEW,

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Underwater cultural heritage

Vermilion has undertaken an assessment of underwater cultural heritage:

Wandoo Field Geophysical and Geotechnical Survey Environment Plan	There are no cultural heritage artefacts identified within the Operational Area or EMBA. There are no historical wrecks within the Operational Area or within a 100 km buffer of the EMBA. There are no registered Aboriginal cultural heritage sites within the Operational Area, 52 registered sites are present within the EMBA.
Wandoo Field Exploration Drilling Environment Plan	There are no cultural heritage artefacts identified within the Operational Area. The Australasian Underwater Cultural Heritage Database identified one historic underwater cultural heritage artefact within the EMBA. There are no historical wrecks within the Operational Area. However, there are 31 historical wrecks within a 100 km buffer of the EMBA. HMAS *Sydney II* and HSK *Kormoran* Shipwreck Sites are located within the EMBA.

	There are no registered Aboriginal cultural heritage sites within the Operational Area, 283 registered sites are present within the EMBA.

Vermilion also advises that it has contacted the West Australian Museum and the Department of Planning, Lands and Heritage (DPLH) as part of our consultation.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.16. Email to Department of Planning, Lands and Heritage (DPLH) on 3 December 2024

Dear DPLH,

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Underwater cultural heritage and historical wrecks

Vermilion has undertaken an assessment of underwater cultural heritage and historical wrecks:

Wandoo Field Geophysical and Geotechnical Survey Environment Plan	There are no cultural heritage artefacts identified within the Operational Area or EMBA. There are no historical wrecks within the Operational Area or within a 100 km buffer of the EMBA. There are no registered Aboriginal cultural heritage sites within the Operational Area, 52 registered sites are present within the EMBA.
Wandoo Field Exploration Drilling Environment Plan	There are no cultural heritage artefacts identified within the Operational Area. The Australasian Underwater Cultural Heritage Database identified one historic underwater cultural heritage artefact within the EMBA.

	There are no historical wrecks within the Operational Area. However, there are 31 historical wrecks within a 100 km buffer of the EMBA. HMAS *Sydney II* and HSK *Kormoran* Shipwreck Sites are located within the EMBA. There are no registered Aboriginal cultural heritage sites within the Operational Area, 283 registered sites are present within the EMBA.

Vermilion also advises that it has contacted the West Australian Museum and the Department of Climate Change, Energy, the Environment and Water (DCCEEW) as part of our consultation.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.17. Email to Western Australian Museum (WAM) on 3 December 2024

Dear Western Australian Museum

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Underwater cultural heritage – historical shipwrecks

Vermilion has undertaken an assessment of historical shipwrecks:

Wandoo Field Geophysical and Geotechnical Survey Environment Plan	There are no historical wrecks within the Operational Area or within a 100 km buffer of the EMBA.
Wandoo Field Exploration Drilling Environment Plan	There are no historical wrecks within the Operational Area. However, there are 31 historical wrecks within a 100 km buffer of the EMBA. HMAS *Sydney II* and HSK *Kormoran* Shipwreck Sites are located within the EMBA.

Vermilion also advises that it has contacted the Department of Planning, Lands and Heritage (DPLH) as part of our consultation.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for

the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.18. Email to Beagle No. 1 Pty Ltd / Longreach Capital Investment, BP Developments Australia, Chevron Australia, Finder No 16 Pty Ltd, INPEX Browse E&P Pty Ltd, Jadestone Energy (Australia) Pty Ltd, Kato Energy (WA) Pty Ltd, Kufpec (Perth) Pty Ltd, MEO International Pty Ltd, Mobil Australia Resources Company Pty Limited, Santos Offshore Pty Ltd, Shell Australia Pty Ltd, Western Gas (474 P) Pty Ltd, Woodside Energy (Australia) Pty Ltd on 3 December 2024

Dear Titleholder

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.19. Email to City of Karratha, Town of Port Hedland, Shire of Ashburton, Shire of Exmouth, Port Hedland Chamber of Commerce and Industry, Western Australian Local Government Association (WALGA), Karratha and Districts Chamber of Commerce and Industry (KDCCI), Regional Development Australia (Pilbara) Karratha WA, Vocus Communications on 3 December 2024

Dear Stakeholder

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.20. Email to 3D Energi Limited, Bengal Energy Ltd, Eni Australia B.V., EOG Resources Australia Pty Ltd, IPB WA 424P Pty Ltd, Pathfinder Energy Pty Ltd, Pilot Energy Limited, Triangle Energy (Operations) Pty Ltd on 3 December 2024

Dear Titleholder

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit an Environment Plan for offshore oil exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration drilling activities proposed under our Environment Plan for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

A consultation information sheet for the proposed activities is attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. This is also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plan, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plan which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.21. Email to Broome Chamber of Commerce and Industry, Shire of Carnarvon, Shire of East Pilbara, Shire of Broome, Shire of Shark Bay, Shire of Northampton on 3 December 2024

Dear Stakeholder

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit an Environment Plan for offshore oil exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration drilling activities proposed under our Environment Plan for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

A consultation information sheet for the proposed activities is attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. This is also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plan, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plan which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.22. Email to Karajarri Traditional Lands Association (Aboriginal Corporation) RNTBC (KTLAAC) on 3 December 2024

Dear [redacted]

Following our previous correspondence on 9 October 2024 (below), we act on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting Karajarri Traditional Lands Association (Aboriginal Corporation) RNTBC (**KTLAAC**) to provide further information on proposed activities in the Wandoo Field and providing an opportunity for KTLAAC to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit an Environment Plan for exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached is a summary information sheet that explains the activities Vermillion plan to undertake.

We have included a map showing the planning area ('environment that may be affected' (EMBA)) in respect to KTLAAC's native title determination.

A detailed consultation information sheet can be found on Vermillion's website here: Wandoo Field Exploration Drilling Environment Plan

Vermillion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into their environmental planning.

Vermilion believes that Native Title Holders, like KTLAAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with KTLAAC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet KTLACC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to KTLACC's members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for

acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

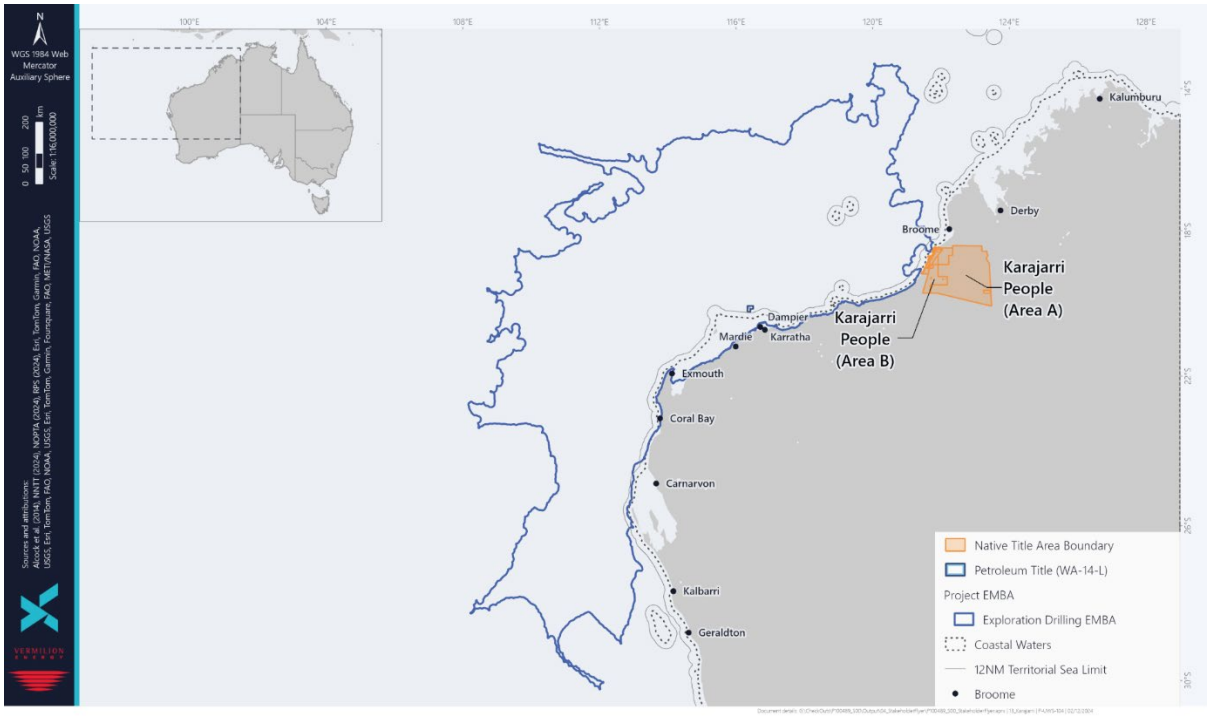
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.22.1. Attachment to email sent to Karajarri Traditional Lands Association (Aboriginal Corporation) RNTBC (KTLAAC) on 3 December 2024



3.23. Email to Kariyarra Aboriginal Corporation RNTBC (KAC) on 3 December 2024

Hi [redacted]

Thank you for your email below and the attaching Consultation Flow Chart.

Following our previous correspondence on 9 October 2024**,** we are contacting you to provide further information on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are also providing further information on proposed activities in the Wandoo Field and providing an opportunity for the Kariyarra Aboriginal Corporation RNTBC (**KAC**) to participate in the environmental planning consultation process, noting the process set out in the Consultation Flow Chart.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached are summary information sheets that explain the activities Vermillion plans to undertake.

We have included two maps showing the planning area ('environment that may be affected' (EMBA)) in respect to KAC's native title determination.

Detailed consultation information sheets have been attached and can be found at the links below:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermilion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like KAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with KAC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet KAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to KAC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

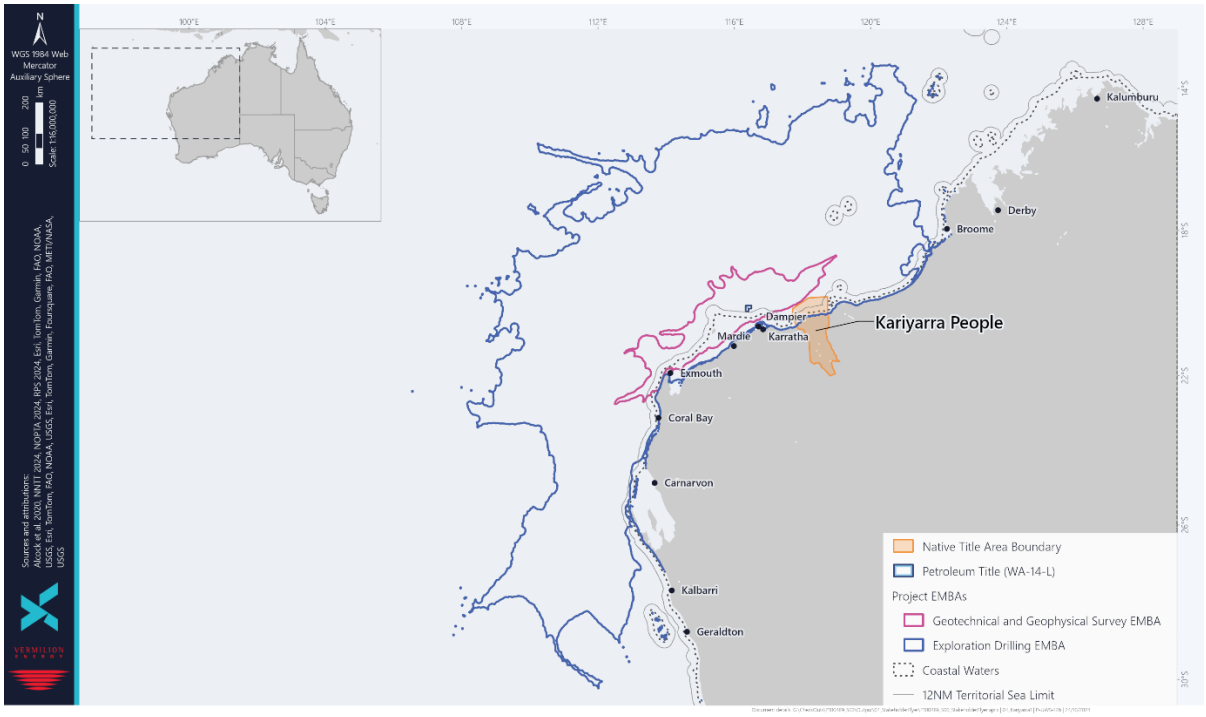
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

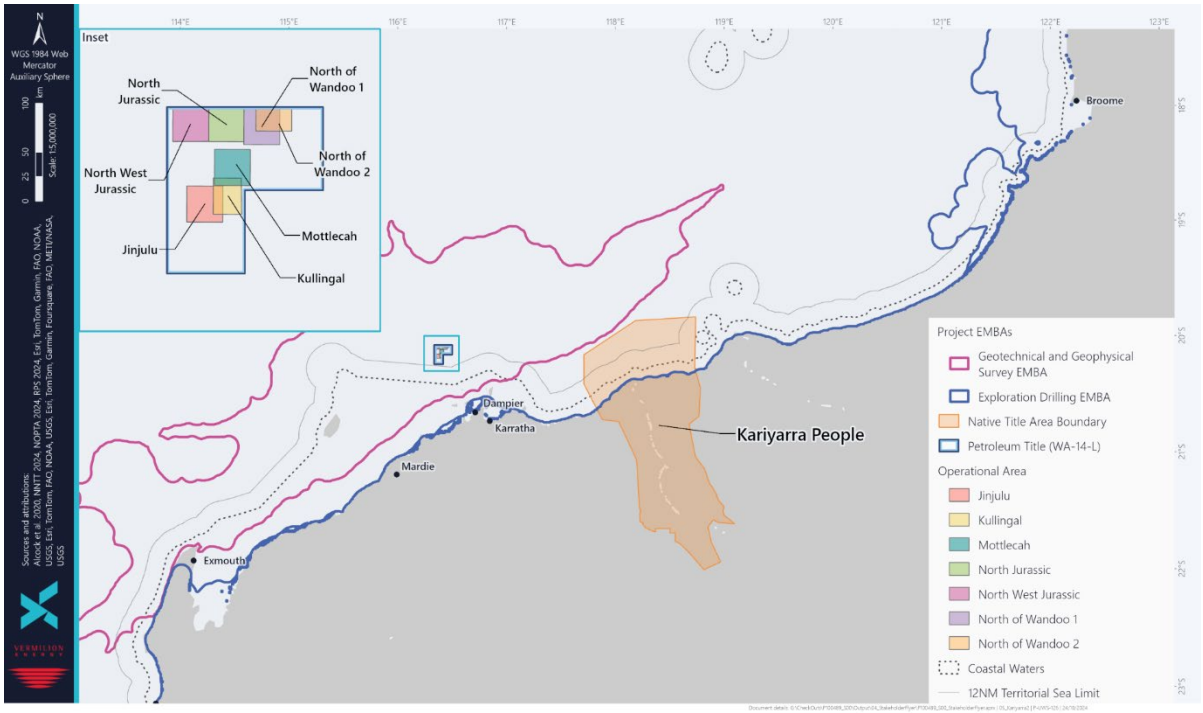
We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.23.1. Attachment to email sent to Kariyarra Aboriginal Corporation RNTBC (KAC) on 3 December 2024



3.23.2. Attachment to email sent to Kariyarra Aboriginal Corporation RNTBC (KAC) on 3 December 2024



3.24. Email to Malgana Aboriginal Corporation (MAC) on 3 December 2024

Dear [redacted]

Following our previous correspondence on 9 October 2024 (below), we act on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting the Malgana Aboriginal Corporation (**MAC**) to provide further information on proposed activities in the Wandoo Field and providing an opportunity for MAC to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached are summary information sheets that explain the activities Vermillion plans to undertake.

We have included two maps showing the planning area ('environment that may be affected' (EMBA)) in respect to MAC native title determination.

Detailed consultation information sheets have been attached and can be found at the links below:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermilion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like MAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with MAC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet MAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to MAC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

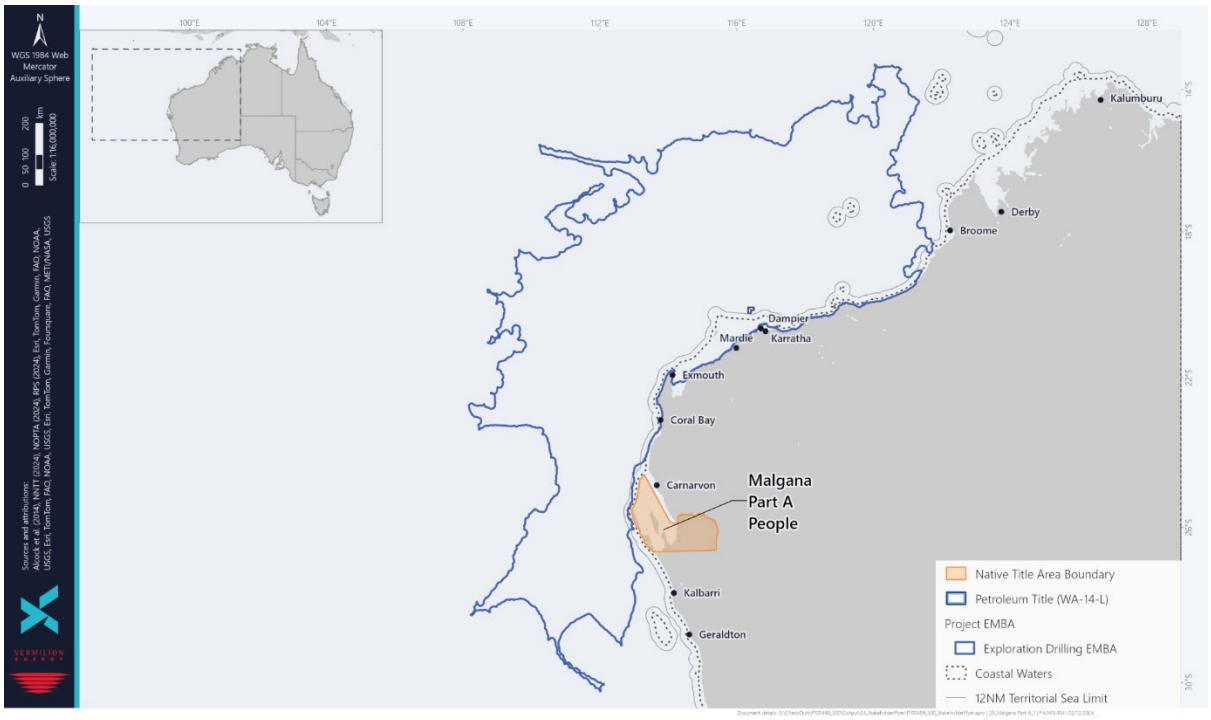
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.24.1. Attachment to email sent to Malgana Aboriginal Corporation (MAC) on 3 December 2024



3.25. Email to Nanda Aboriginal Corporation RNTBC (NAC) on 3 December 2024

Dear [redacted]

Following our previous correspondence on 17 October 2024 (below), we act on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting the Nanda Aboriginal Corporation RNTBC (**NAC**) to provide further information on proposed activities in the Wandoo Field and providing an opportunity for NAC to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached are summary information sheets that explain the activities Vermillion plans to undertake.

We have included two maps showing the planning area ('environment that may be affected' (EMBA)) in respect to NAC native title determination.

Detailed consultation information sheets have been attached and can be found at the links below:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermilion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like NAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with NAC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet NAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to NAC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for

acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

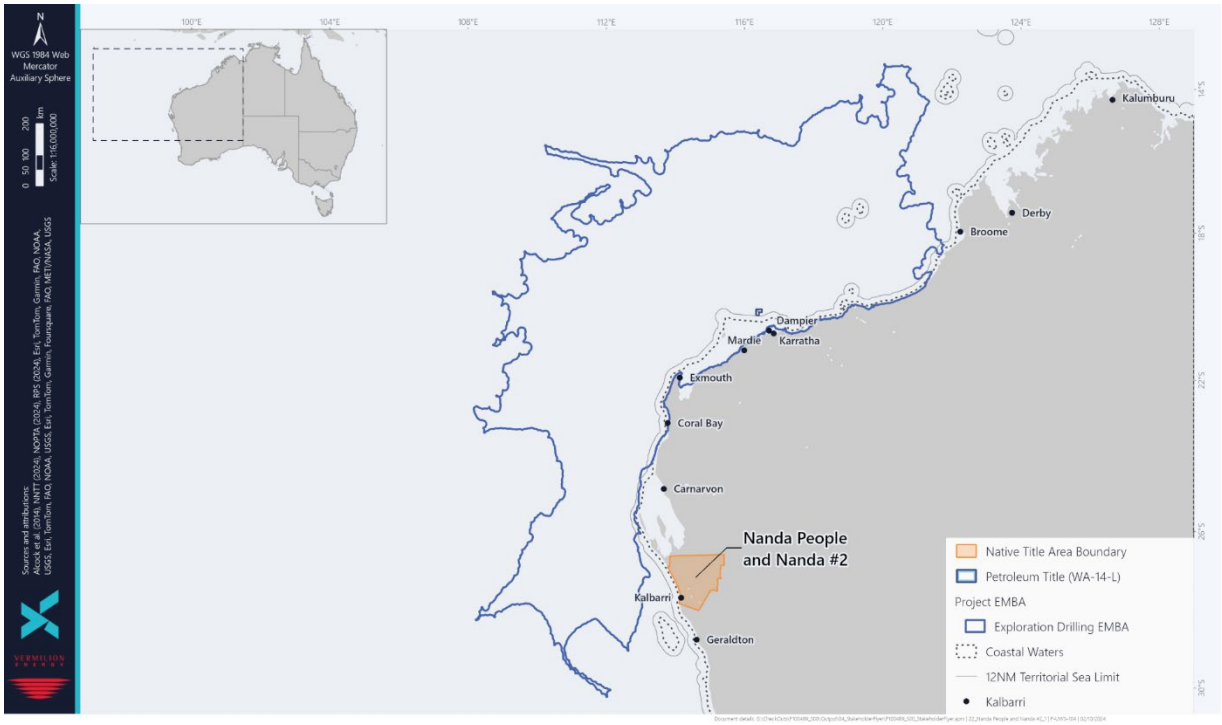
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

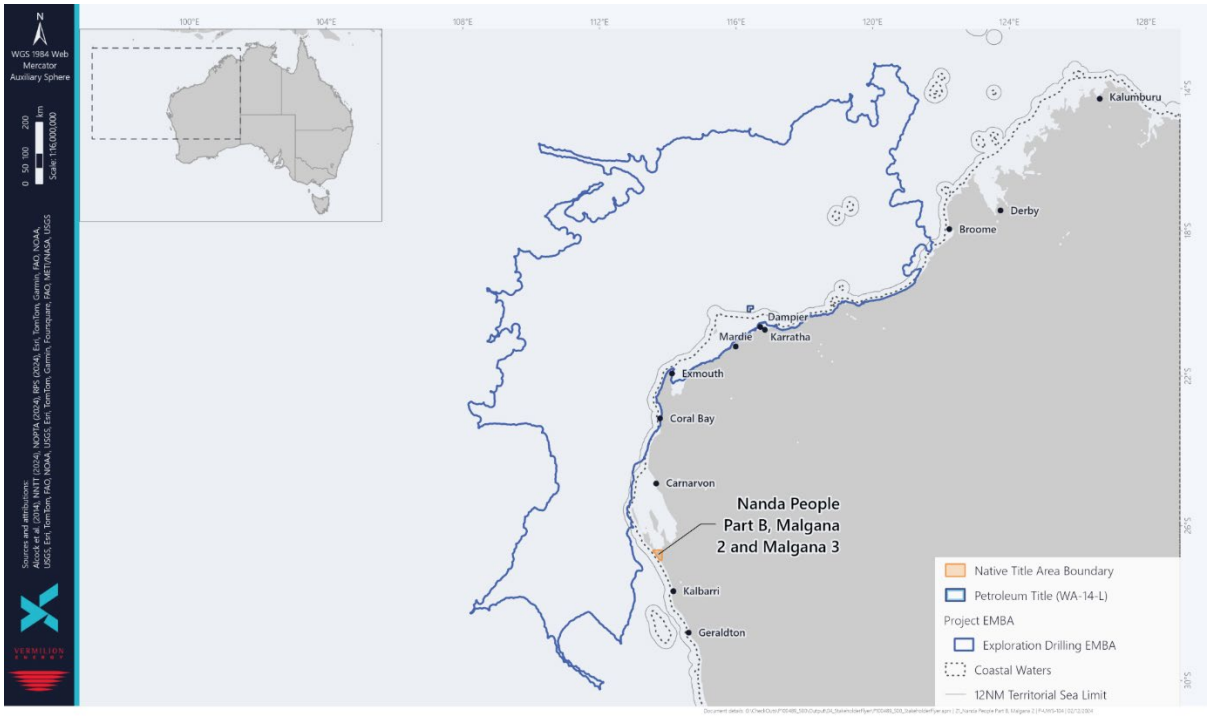
We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.25.1. Attachment to email sent to Nanda Aboriginal Corporation RNTBC (NAC) on 3 December 2024



3.25.2. Attachment to email sent to Nanda Aboriginal Corporation RNTBC (NAC) on 3 December 2024



3.26. Email to Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC) on 3 December 2024

Dear [redacted]

Following our previous correspondence on set out below, we are contacting the Nganhurra Thanardi Garrbu Aboriginal Corporation (**NTGAC**) to provide further information on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are also contacting NTGAC to provide further information on proposed activities in the Wandoo Field and providing an opportunity for NTGAC to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached are summary information sheets that explain the activities Vermillion plans to undertake.

We have included two maps showing the planning area ('environment that may be affected' (EMBA)) in respect to NTGAC native title determination.

Detailed consultation information sheets have been attached and can be found at the links below:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermilion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like NTGAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with NTGAC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet NTGAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to NTGAC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for

acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

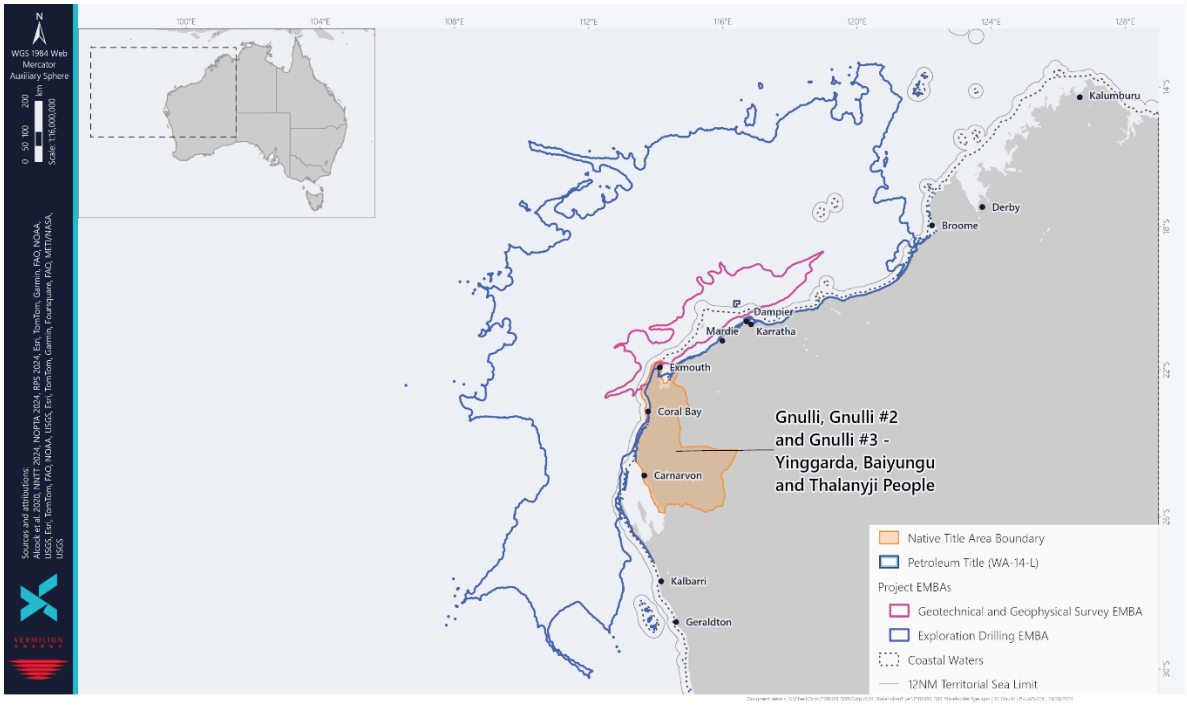
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

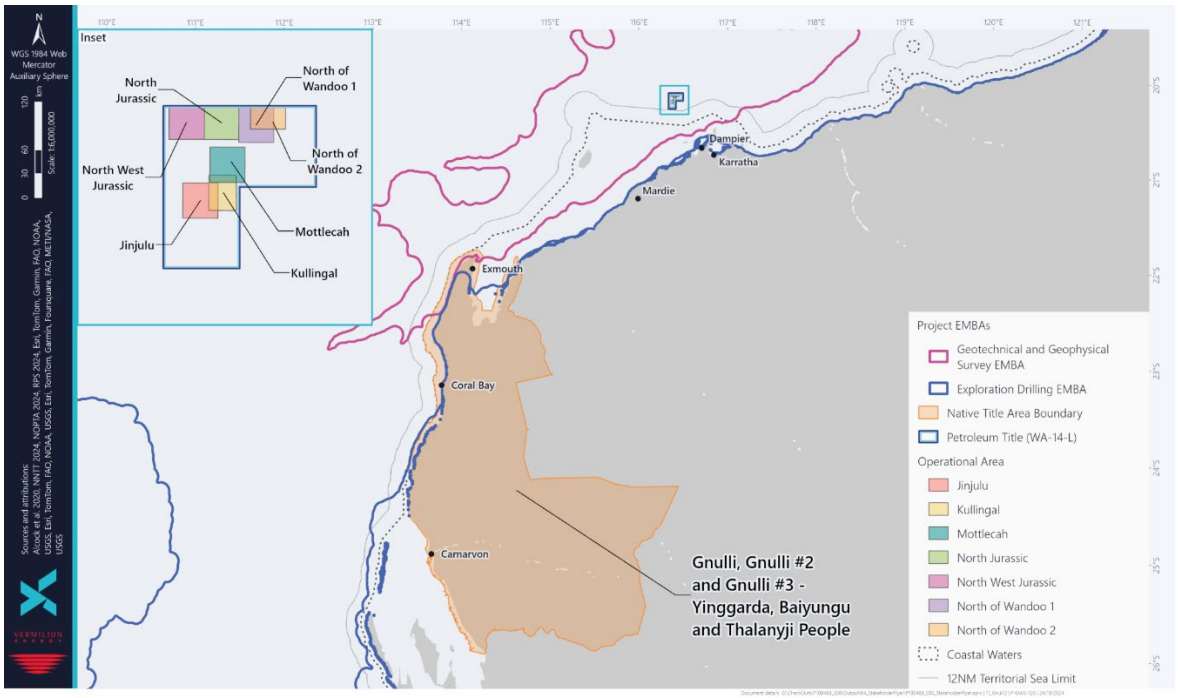
We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.26.1. Attachment to email sent to Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC) on 3 December 2024



3.26.2. Attachment to email sent to Nganhurra Thanardi Garrbu Aboriginal Corporation (NTGAC) on 3 December 2024



3.27. Email to Ngarluma Aboriginal Corporation RNTBC (NAC) on 3 December 2024

Dear [redacted]

Following our previous correspondence on 9 October 2024 (below), we act on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting the Ngarluma Aboriginal Corporation RNTBC (**NAC**) to provide further information on proposed activities in the Wandoo Field and providing an opportunity for **NAC** to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

We have included two maps showing the planning area ('environment that may be affected' (EMBA)) in respect to NAC native title determination.

Detailed consultation information sheets have been attached and can be found at the links below:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermilion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like NAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with NAC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet NAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to NAC's members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

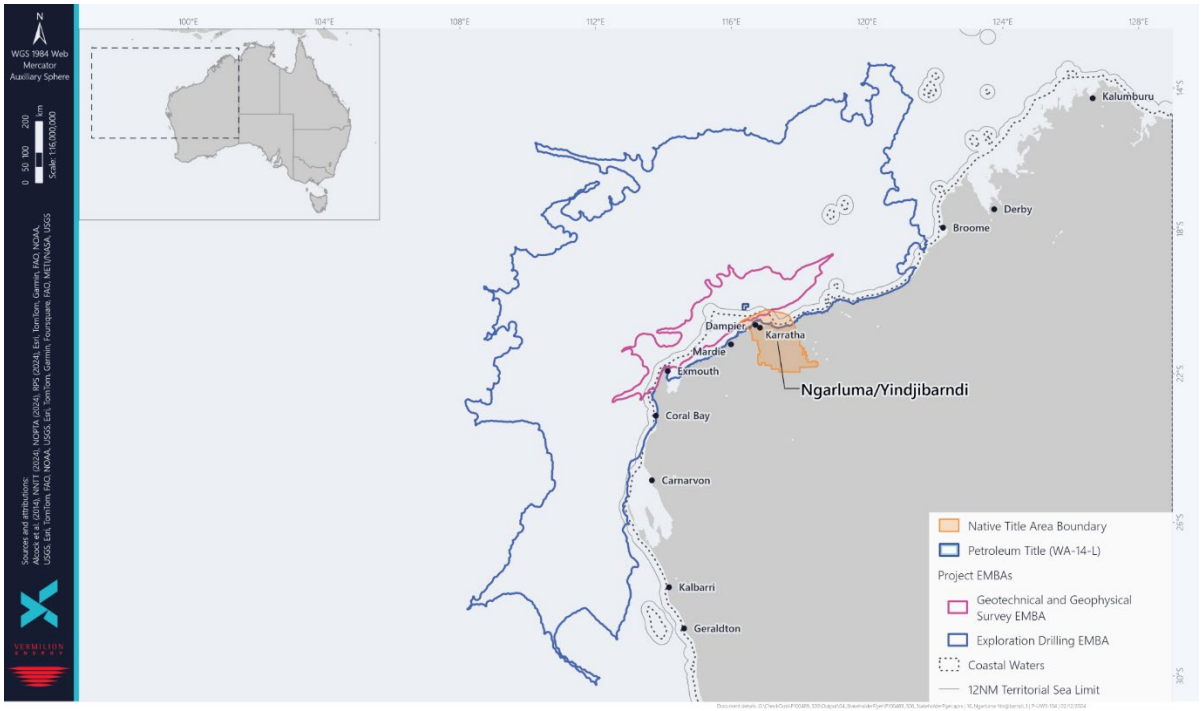
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

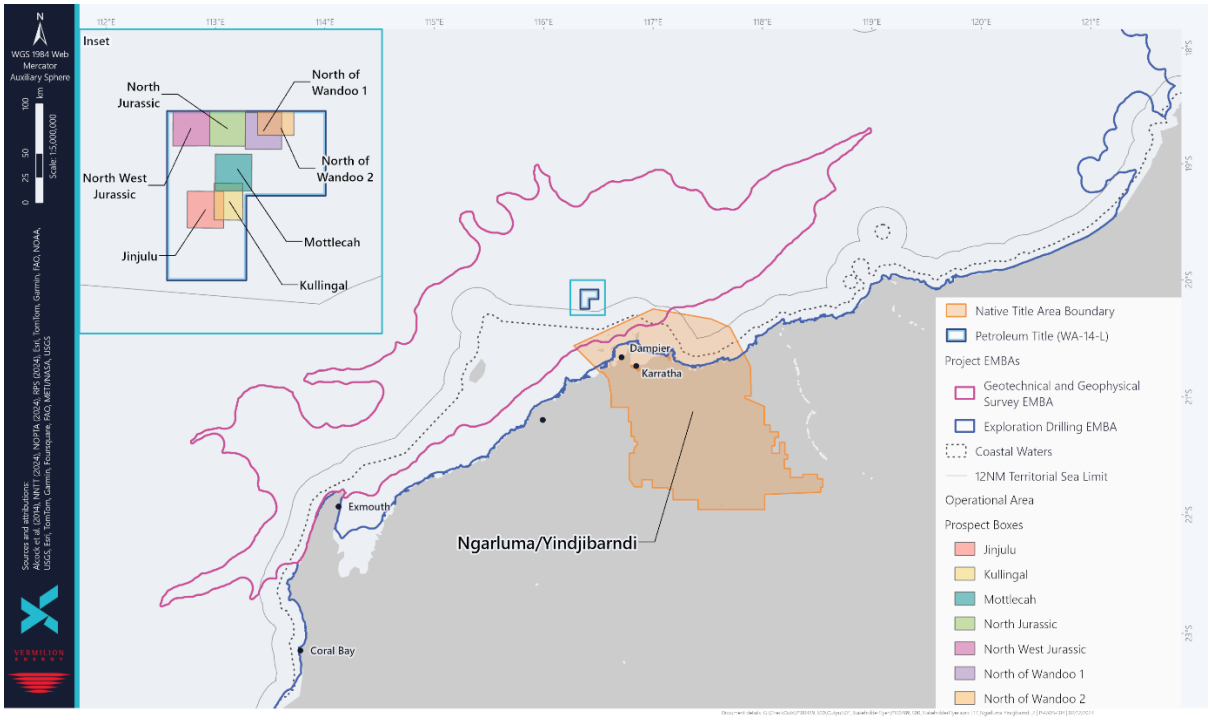
We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.27.1. Attachment to email sent to Ngarluma Aboriginal Corporation RNTBC (NAC) on 3 December 2024



3.27.2. Attachment to email sent to Ngarluma Aboriginal Corporation RNTBC (NAC) on 3 December 2024



3.28. Email to Nyangumarta Karajarri Aboriginal Corporation RNTBC (NKAC) on 3 December 2024

Dear [redacted]

Following our previous correspondence on 14 October 2024 (below**),** we act on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting Nyangumarta Karajarri Aboriginal Corporation RNTBC (**NKAC**) to provide further information on proposed activities in the Wandoo Field and providing an opportunity for NKAC to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit an Environment Plan for exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached is a summary information sheet that explains the activities Vermilion plans to undertake.

We have included a map in showing the planning area ('environment that may be affected' (EMBA)) in respect to NKAC native title determination.

A detailed consultation information sheet can be found on Vermillion's website here: Wandoo Field Exploration Drilling Environment Plan.

Vermillion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like NKAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with NKAC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet NKAC 's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to NKAC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

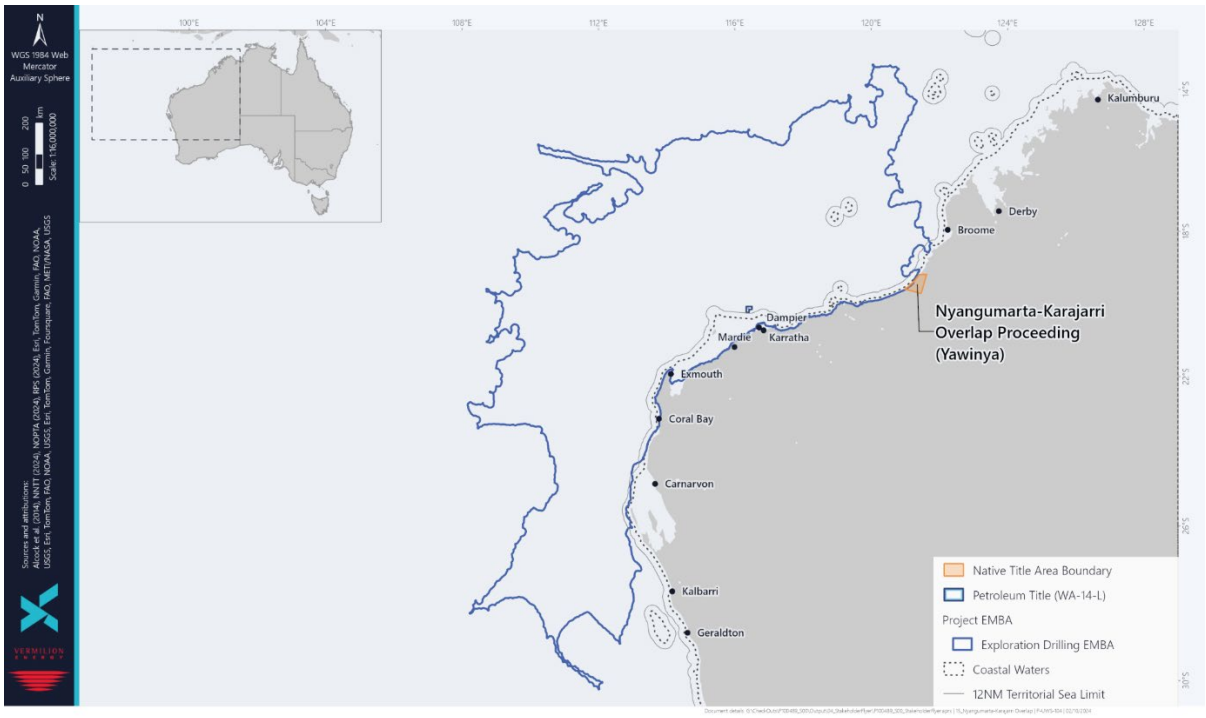
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.28.1. Attachment to email sent to Nyangumarta Karajarri Aboriginal Corporation RNTBC (NKAC) on 3 December 2024



3.29. Email to Nyangumarta Warrarn Aboriginal Corporation RNTBC (NWAC) on 3 December 2024

Dear [redacted]

Following our previous correspondences set out below, we are contacting Nyangumarta Warrarn Aboriginal Corporation RNTBC (**Nyangumarta Warrarn AC**) to provide further information on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting Nyangumarta Warrarn AC to provide further information on proposed activities in the Wandoo Field and providing an opportunity for Nyangumarta Warrarn AC to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit an Environment Plan for exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached is a summary information sheet that explains the activities Vermilion plans to undertake.

We have included a map in showing the planning area ('environment that may be affected' (EMBA)) in respect to Nyangumarta Warrarn AC native title determination.

A detailed consultation information sheet can be found on Vermillion's website here: Wandoo Field Exploration Drilling Environment Plan.

Vermillion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like Nyangumarta Warrarn AC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with Nyangumarta Warrarn AC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet Nyangumarta Warrarn AC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to Nyangumarta Warrarn AC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

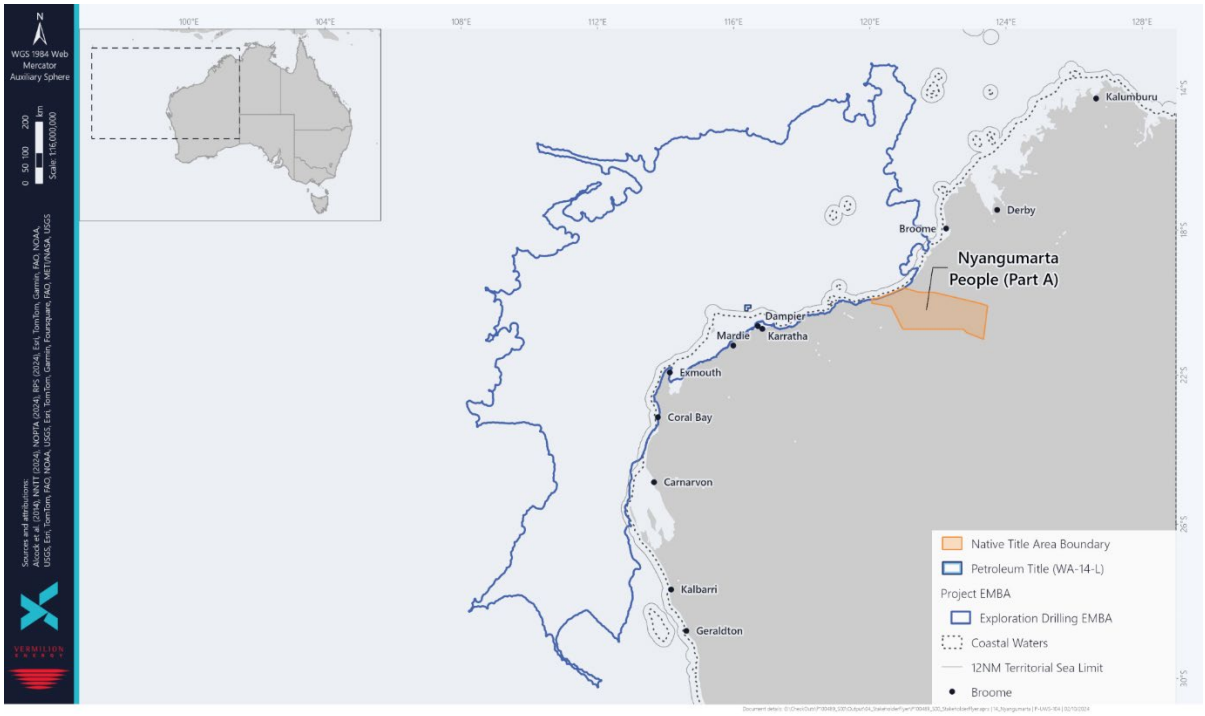
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.29.1. Attachment to email sent to Nyangumarta Warrarn Aboriginal Corporation RNTBC (NWAC) on 3 December 2024



3.30. Email to Wanparta Aboriginal Corporation RNTBC (WAC) on 3 December 2024

Hi [redacted]

Following our previous correspondence on set out below, we are contacting the Wanparta Aboriginal Corporation RNTBC (**WAC**) to provide further information behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting WAC to provide further information on proposed activities in the Wandoo Field and providing an opportunity for WAC to participate in the environmental planning consultation

process. We would be pleased if you could provide us the date of the first WAC meeting in 2025, to discuss the proposed activities, seek your input and engage in consultation.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached are summary information sheets that explain the activities Vermillion plans to undertake.

We have included two maps showing the planning area ('environment that may be affected' (EMBA)) in respect to WAC native title determination.

Detailed consultation information sheets have been attached and can be found at the links below:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermilion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like WAC might be relevant for participating in consultation as part of the environmental planning process.

However, Vermilion would like to ensure the engagement is tailored to meet WAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to WAC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

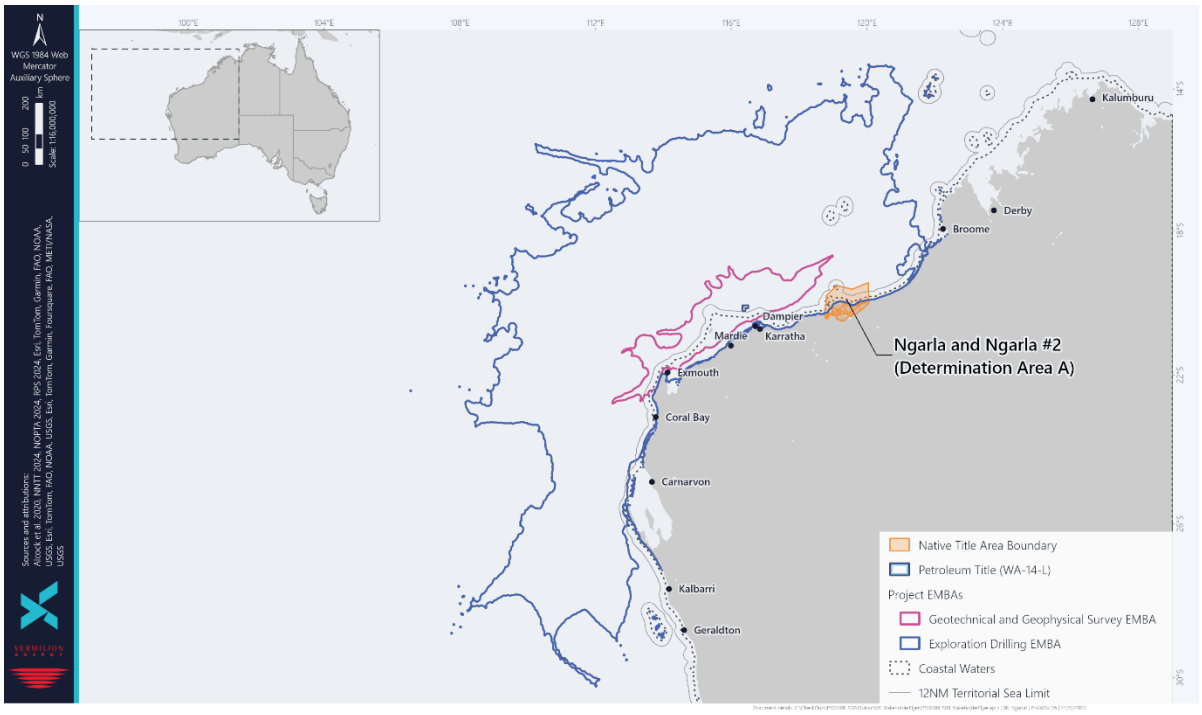
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

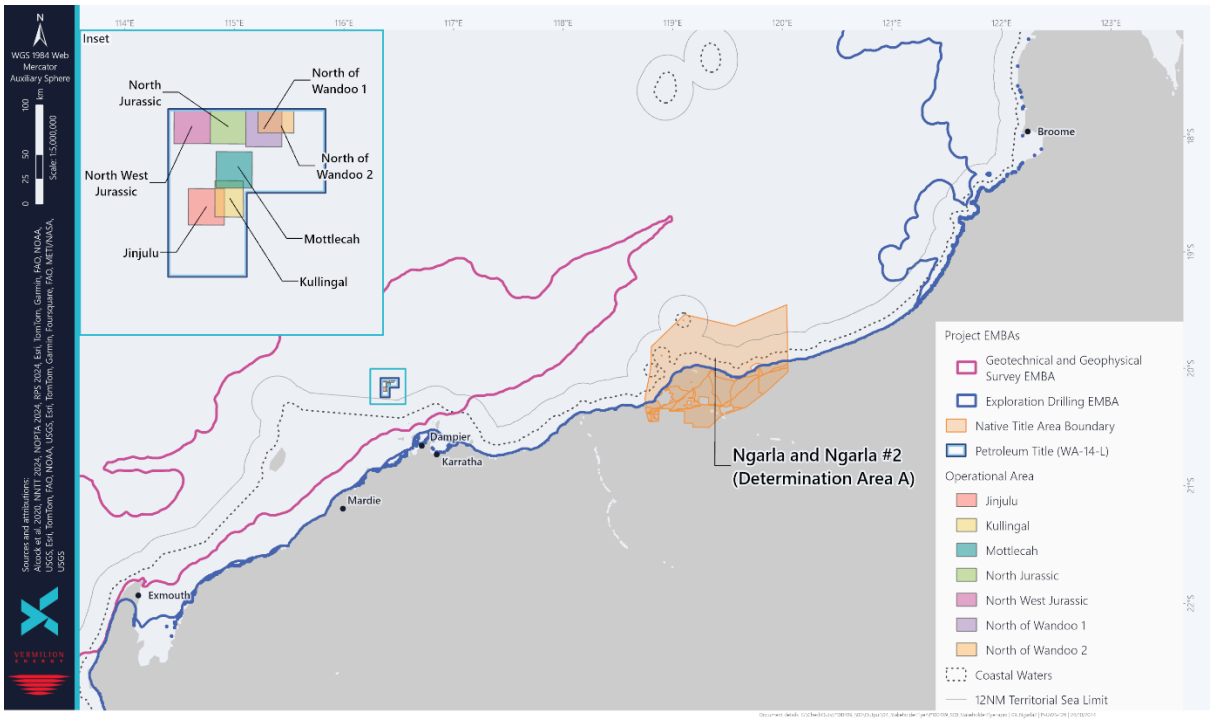
We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.30.1. Attachment to email sent to Wanparta Aboriginal Corporation RNTBC (WAC) on 3 December 2024



3.30.2. Attachment to email sent to Wanparta Aboriginal Corporation RNTBC (WAC) on 3 December 2024



3.31. Email to Wirrawandi Aboriginal Corporation RNTBC (WAC) on 3 December 2024

Dear [redacted]

Following our previous correspondences set out below, we are contacting the Wirrawandi Aboriginal Corporation RNTBC (**WAC**) to provide further information on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are also providing further information on Vermilion's proposed activities in the Wandoo Field and providing an opportunity for WAC to participate in the environmental planning consultation process.

Thank you for the advice that the most appropriate way to consult with WAC is via its board, we would be pleased if you could advise us once the date is set for the December meeting, or failing that, the first available meet in 2025.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached are summary information sheets that explain the activities Vermillion plans to undertake.

We have included two maps showing the planning area ('environment that may be affected' (EMBA)) in respect to WAC native title determination.

Detailed consultation information sheets have been attached and can be found at the links below:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermilion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like WAC might be relevant for participating in consultation as part of the environmental planning process.

However, Vermilion would like to ensure the engagement is tailored to meet WAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to WAC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

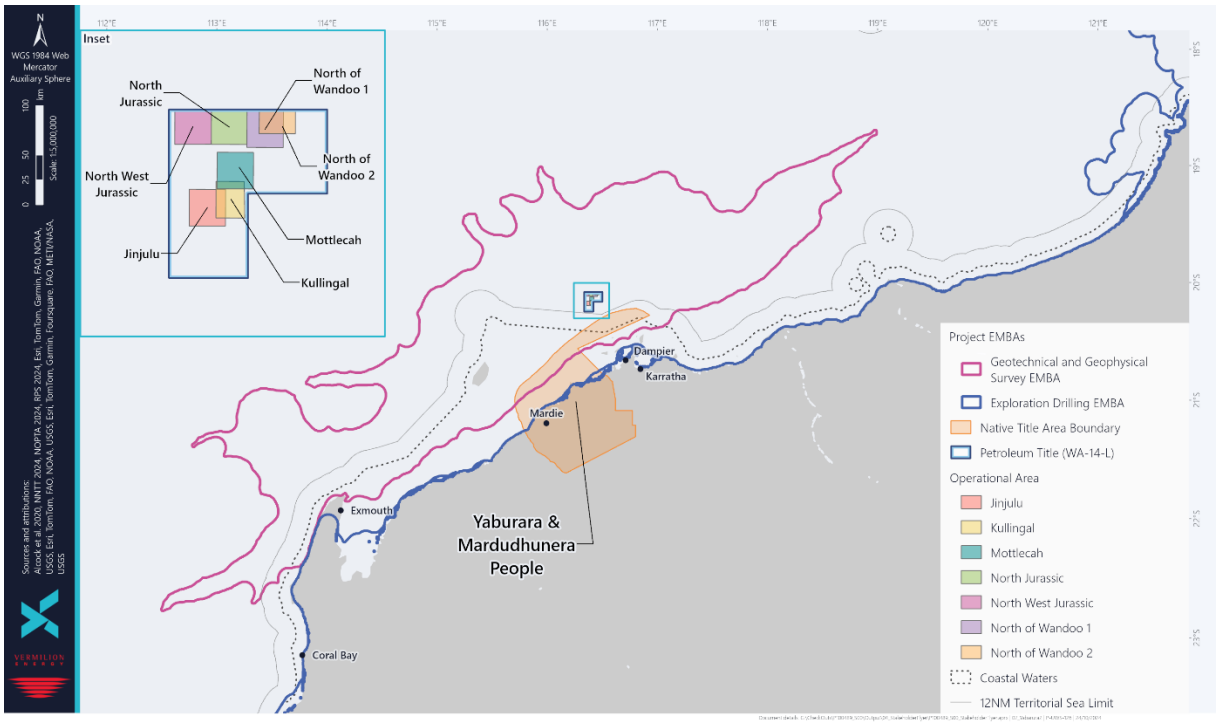
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

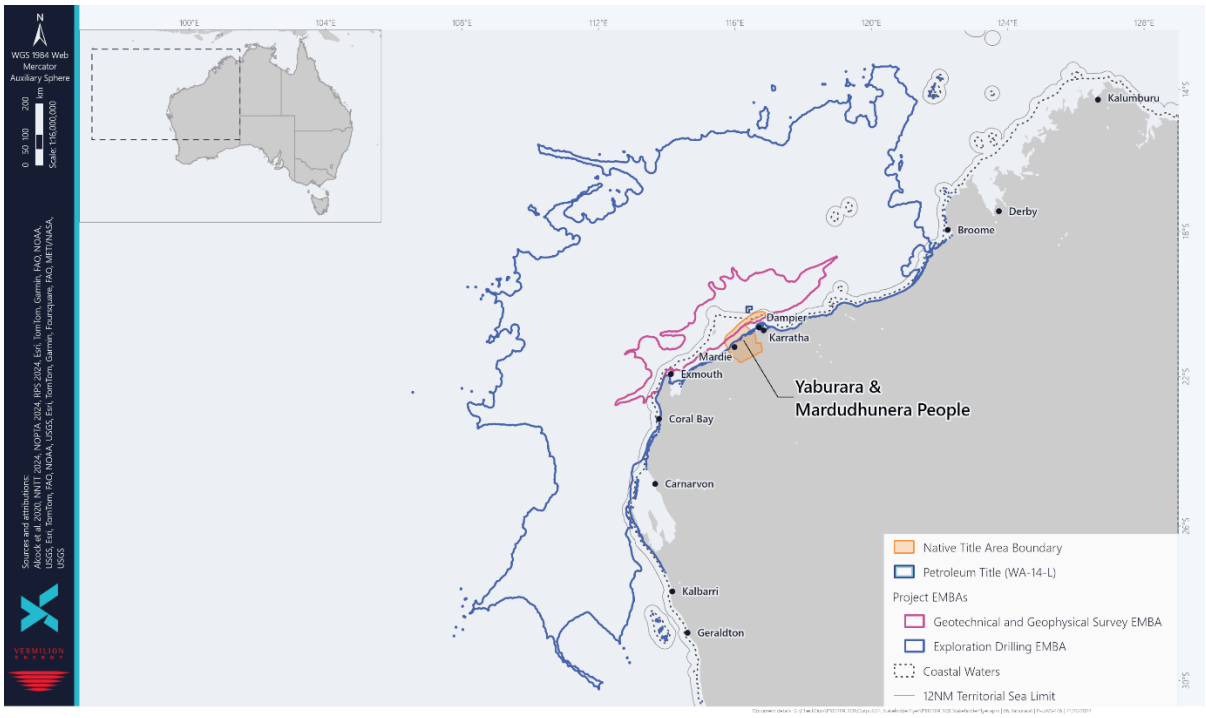
We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.31.1. Attachment to email sent to Wirrawandi Aboriginal Corporation RNTBC (WAC) on 3 December 2024



3.31.2. Attachment to email sent to Wirrawandi Aboriginal Corporation RNTBC (WAC) on 3 December 2024



3.32. Email to Yawuru Native Title Holders Aboriginal Corporation RNTBC (Yawuru) on 3 December 2024

Dear [redacted]

Following our previous correspondence on 17 October 2024 (below), we act on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting the Yawuru Native Title Holders Aboriginal Corporation RNTBC (**Yawuru**) to provide further information on proposed activities in the Wandoo Field and providing an opportunity for Yawuru to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit an Environment Plan for exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached is a summary information sheet that explains the activities Vermilion plans to undertake.

We have included a map in showing the planning area ('environment that may be affected' (EMBA)) in respect to Yawuru native title determination.

A detailed consultation information sheet can be found on Vermillion's website here: Wandoo Field Exploration Drilling Environment Plan.

Vermillion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like **[stakeholder]** might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with **[stakeholder]** and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet [**stakeholder]**'s needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to **[stakeholder]** members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

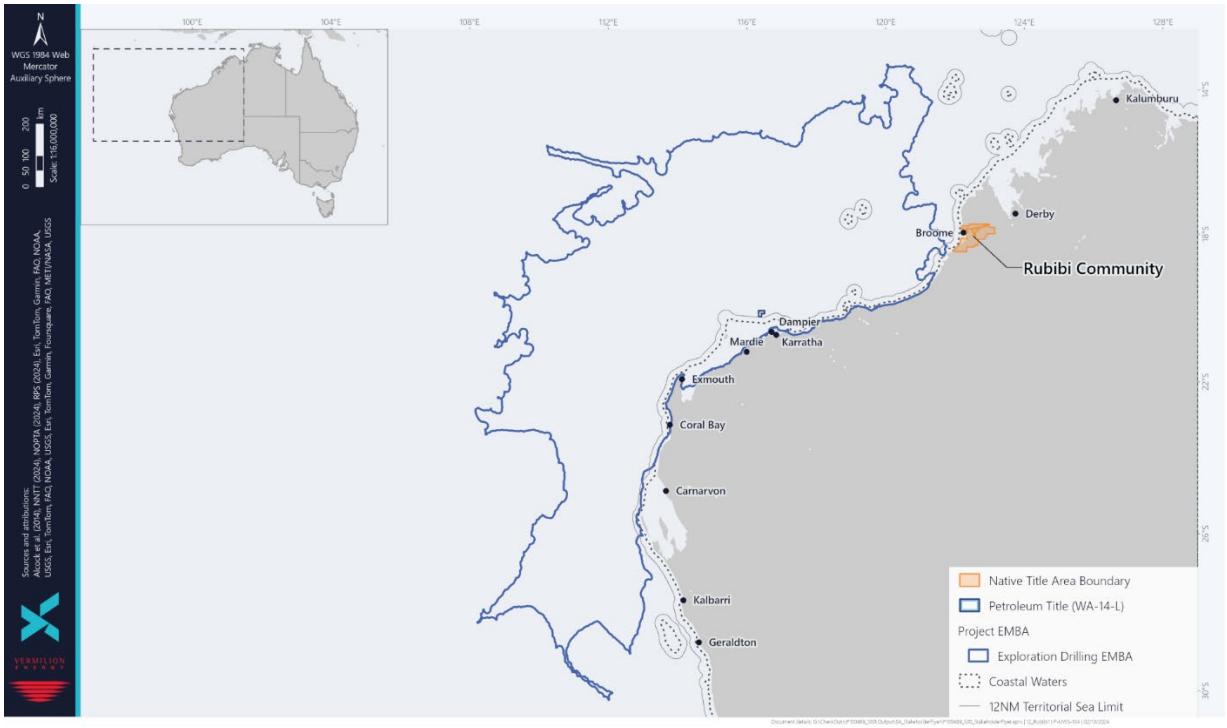
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.32.1. Attachment to email sent to Yawuru Native Title Holders Aboriginal Corporation RNTBC (Yawuru) on 3 December 2024



3.33. Email to Yindjibarndi Aboriginal Corporation (YAC) on 3 December 2024

Dear [redacted]

Following our previous correspondence on 14 October 2024 (below), we act on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting Yindjibarndi Aboriginal Corporation (**YAC**) to provide further information on proposed activities in the Wandoo Field and providing an opportunity for YAC to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached are summary information sheets that explain the activities Vermillion plans to undertake.

We have included two maps showing the planning area ('environment that may be affected' (EMBA)) in respect to YAC native title determination.

Detailed consultation information sheets have been attached and can be found at the links below:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermilion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like YAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with YAC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet YAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to YAC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for

acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

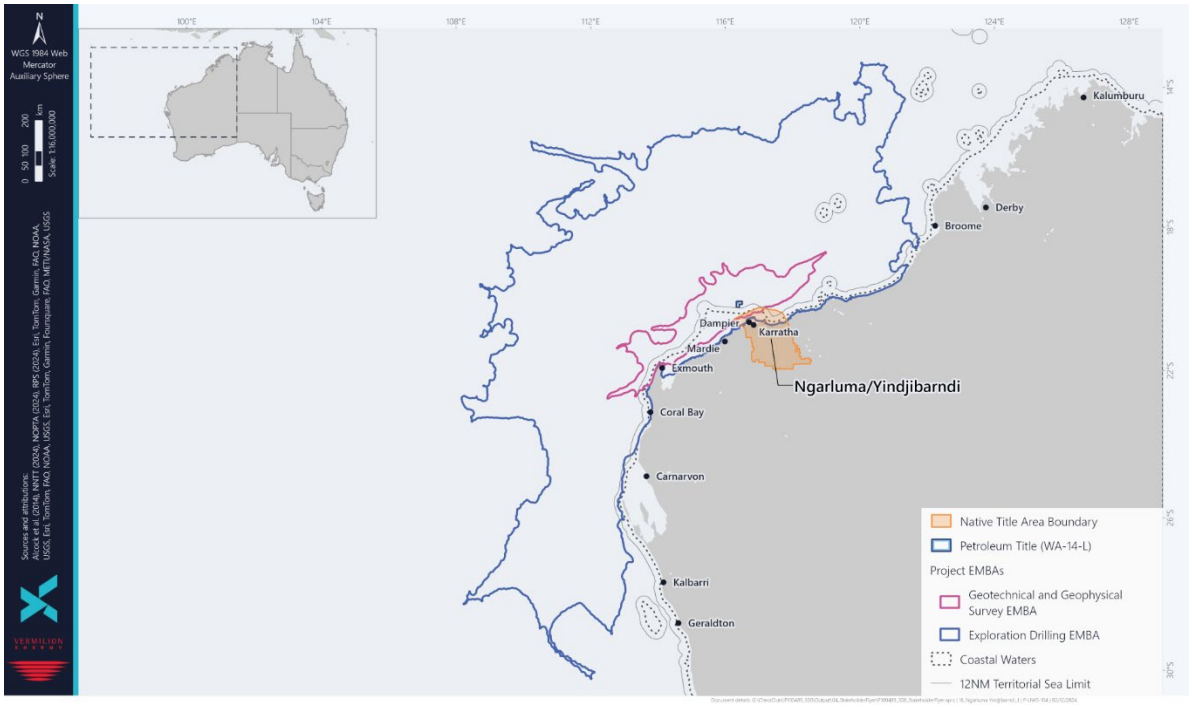
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

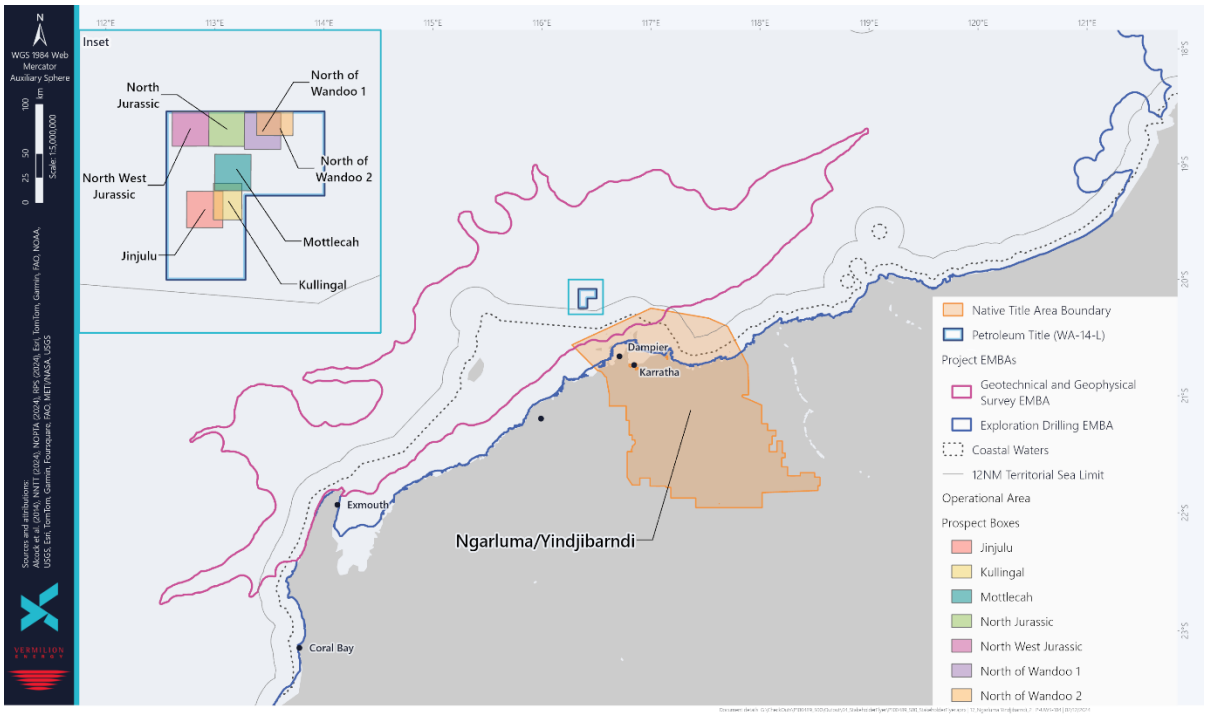
We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.33.1. Attachment to email sent to Yindjibarndi Aboriginal Corporation (YAC) on 3 December 2024



3.33.2. Attachment to email sent to Yindjibarndi Aboriginal Corporation (YAC) on 3 December 2024



3.34. Email to Buurabalayji Thalanyji Aboriginal Corporation RNTBC (BTAC) on 4 December 2024

Dear [redacted]

Following our previous email on 14 October 2024 (set out below), we act on behalf of Vermilion Oil and Gas Australia Pty Ltd (**Vermilion**), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and 110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

We are contacting the Buurabalayji Thalanyji Aboriginal Corporation (**BTAC**) to provide further information on proposed activities in the Wandoo Field and providing an opportunity for BTAC to participate in the environmental planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached are summary information sheets that explain the activities Vermillion plans to undertake.

We have included two maps showing the planning area ('environment that may be affected' (EMBA)) in respect to BTAC native title determination.

Detailed consultation information sheets have been attached and can be found at the links below:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermilion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that Native Title Holders, like BTAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with BTAC and would like to offer a meeting in **February 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet BTAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to BTAC members or other people who you think may be interested as required.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

We look forward to hearing from you and working together to ensure a collaborative consultation process.

Yours sincerely

3.35. Email to West Coast Rock Lobster Managed Fishery on 18 December 2024

Dear West Coast Rock Lobster Fishery

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit an Environment Plan for offshore oil exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration drilling activities proposed under our Environment Plan for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not

limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

A consultation information sheet for the proposed activities is attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. This is also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Information for the commercial fishing sector

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.
- Information about exclusionary zones and communication with fishers and mariners are inlcuded in the attached docments.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plan, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plan which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely,

3.36. Email to Onslow Chamber of Commerce and Industry on 18 December 2024

Dear Onslow Chamber of Commerce and Industry

We are contacting you on behalf of Vermilion Oil and Gas Australia Pty Ltd (Vermilion), which has operations in the Wandoo Field located offshore approximately 80km northwest of Dampier and

110km northeast of Barrow Island. More information about the Wandoo Field operations can be found here.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on the proposed activities

Vermilion is now consulting with relevant persons with functions, interests or activities that may be affected by offshore oil exploration and drilling activities proposed under our Environment Plans for the Wandoo Field. Vermilion's methodology for the assessment of relevant persons is based on (but not limited to) the environment that may be affected (EMBA) assessed for the activity. An EMBA is the largest area where a petroleum activity could potentially have an environmental consequence, either directly or indirectly. The broadest extent of the EMBA considers planned activities and unplanned events and is individual to each proposed activity.

Consultation information sheets for both of the proposed activities are attached, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities. Our website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Seeking your input

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

3.37. Letter sent to Pilbara Kimberley Recreational Marine Users and Gascoyne Recreational Marine Users on 9 December 2024

VERMILION
OIL & GAS
AUSTRALIA PTY LTD

LEVEL 5
30 THE ESPLANADE
PERTH
WESTERN AUSTRALIA 6000

TEL: 08 9217 5858
ABN: 29 113 023 591

9 December 2024

Dear Stakeholder

Consultation on Wandoo Field Geophysical and Geotechnical Survey Environment Plan & Exploration Drilling Environment Plan

Vermilion Oil and Gas Australia Pty Ltd (Vermilion) is planning to submit two Environment Plans for offshore survey and drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L.

Location
The Wandoo Field is situated approximately 80 kilometres northwest of the port Dampier and 110 kilometres northeast of Barrow Island. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth in the range from 50-60 metres. Operational Areas have been defined as a subset of WA-14-L, to encompass the exploration prospects.

Survey activities
Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling activities
Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Consultation Information sheets for both of the proposed activities are enclosed, providing additional background on the proposed activities, including summaries of potential key impacts and risks, and associated management measures. These are also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Feedback
If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by 17 January 2025.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

Vermilion Oil and Gas Australia

3.38. Email to Murujuga Aboriginal Corporation (MAC) on 21 February 2025

Dear [redacted]

We act for Vermilion Oil and Gas Australia (**Vermilion**), who has operations in the Wandoo offshore oil field located approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island. Information about the Wandoo operations can be found at: https://www.vermilionenergy.com/our-operations/australia/ and maps of the title area are attached, shown on the maps as 'Wandoo Field WA-14-L' (**Wandoo Offshore Oil Field**).

We are contacting the Murujuga Aboriginal Corporation (**MAC**) because Vermilion has upcoming proposed activities in the Wandoo Offshore Oil Field. During Vermilion's current consultation it was advised to us that MAC is likely to be a relevant person in relation to the planned activities. We want to provide MAC an opportunity to participate in the environment planning consultation process.

Overview of activities

Vermilion is planning to drill in the Wandoo Field to identify and confirm viable hydrocarbons. This will help continue production at the Wandoo Field in production licence area WA-14-L, which Vermilion has operated for almost 20 years.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Survey activities

Vermilion wants to keep developing and producing from its current permit area. So, the company plans to survey the area with a vessel to investigate the seabed and sub-seabed conditions. This will provide data to decide suitability for the location of a drilling rig that could be used in potential exploration drilling.

Drilling activities

Vermilion has completed seven drilling campaigns in the field's history and plans to drill one near-field exploration well in late 2025. Depending on the results, Vermilion may drill up to four more exploration wells over the next five years within its current production licence area WA-14-L.

Attached are summary information sheets that explain the activities Vermilion plans to undertake.

We have included a map in showing the planning area ('environment that may be affected' (EMBA)) in respect to lands and waters managed by MAC.

Detailed consultation information sheets can be found on Vermillion's website here:

- Wandoo Field Geophysical and Geotechnical Environment Plan
- Wandoo Field Exploration Drilling Environment Plan

Vermillion's website includes resources for further information including frequently asked questions about Wandoo Field Environment Plan Consultation, which can be accessed here.

Feedback on the proposed activities

Vermilion recognises the importance of cultural heritage to the Native Title Holders and First Nations people and are committed to ensuring these values are respected and integrated into our environmental planning.

Vermilion believes that land and water managers and organisations like MAC might be relevant for participating in consultation as part of the environmental planning process.

Vermilion would welcome the opportunity to meet with MAC and would like to offer a meeting during **March 2025** to discuss the proposed activities, seek your input and engage in consultation.

However, Vermilion would like to ensure the engagement is tailored to meet MAC's needs. As such, if a formalised consultation agreement is required, we ask you to please provide this documentation before coordinating any meetings.

Please feel free to forward this email and the attached documents to MAC's members or other people who you think may be interested as required.

Seeking your input

The purpose of this consultation is to give MAC the opportunity to provide input into:

- Vermilion's understanding of the current environment that could be impacted by their proposed activities, including its cultural characteristics;
- how Vermilion's activities might affect the existing environment, including cultural aspect; and
- potential measures and controls to reduce the environmental impact of the proposed activities on MAC's functions, interests, and activities.

If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **25 March 2025.**

Confidentiality and information sharing

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (**NOPSEMA**) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

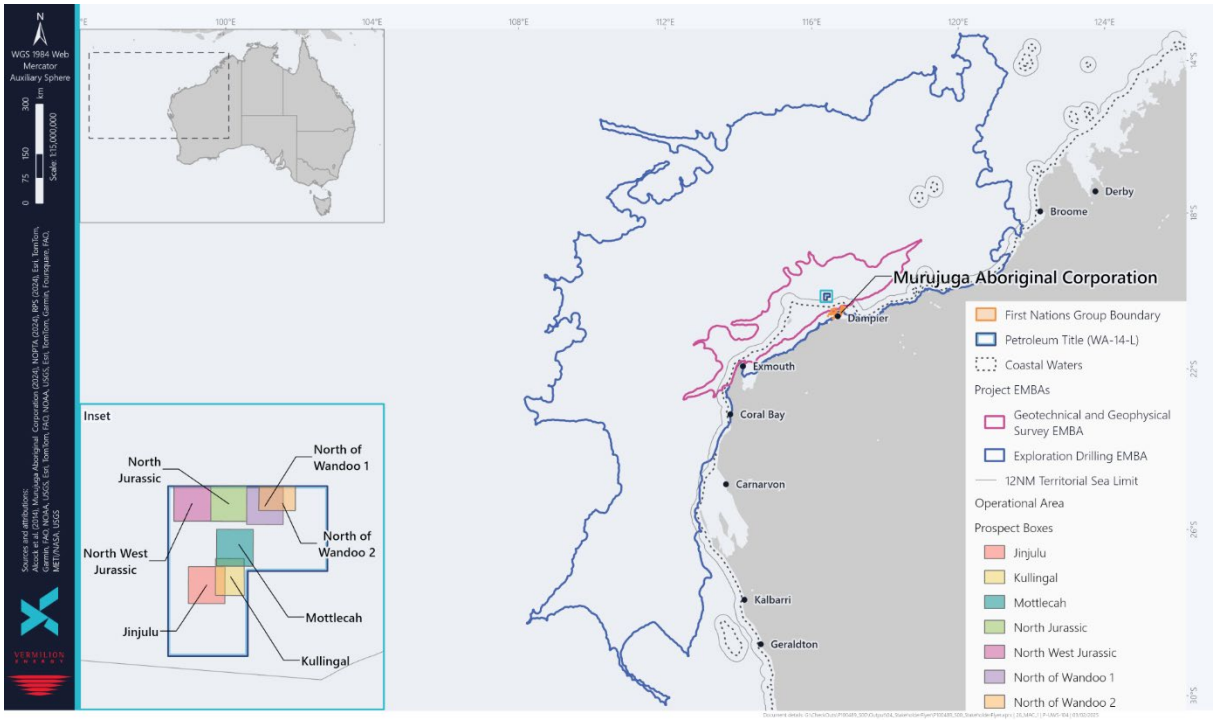
Please let us know if your feedback on this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Alternatively, if you would prefer to opt out of this consultation or wish to discontinue receiving updates, please respond or email abu.consultation@vermilionenergy.com indicating your preference.

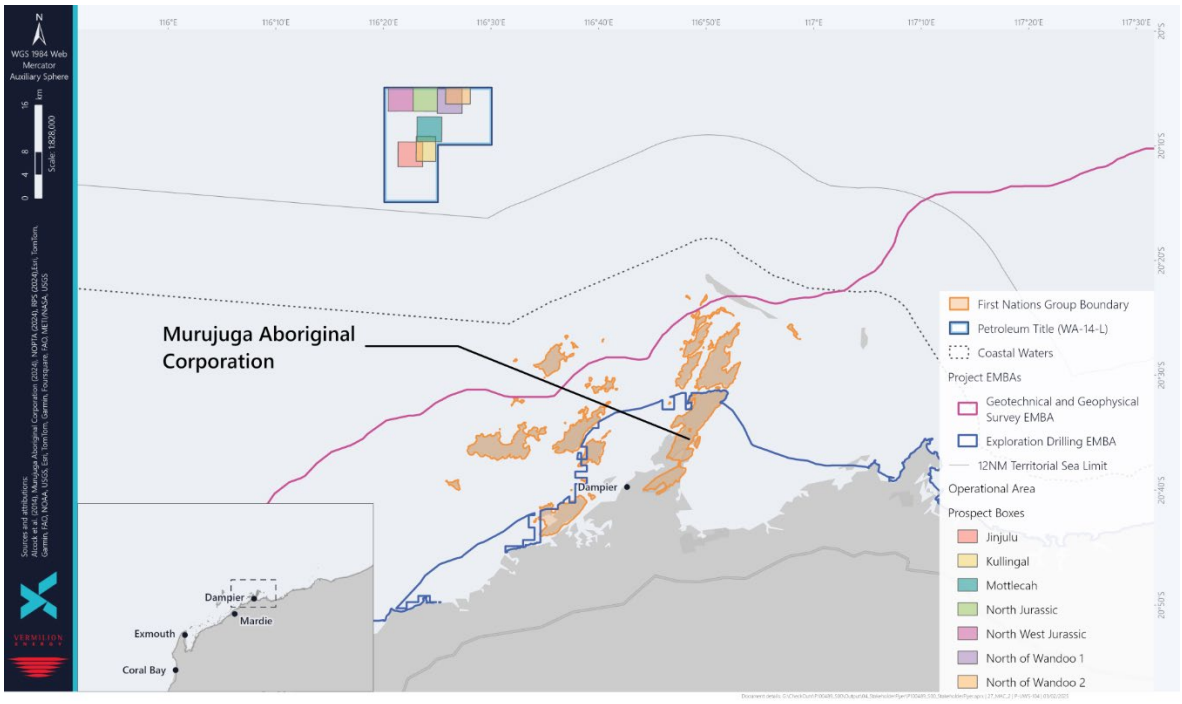
We look forward to hearing from you and working together to ensure a collaborative consultation process.

Regards

3.38.1. Attachment to email sent to Murujuga Aboriginal Corporation (MAC) on 21 February 2025



3.38.2. Attachment to email sent to Murujuga Aboriginal Corporation (MAC) on 21 February 2025



3.39. Letter sent to West Coast Recreational Marine Users on 9 December 2024

VERMILION
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AUSTRALIA PTY LTD

LEVEL 5
30 THE ESPLANADE
PERTH
WESTERN AUSTRALIA 6000

TEL: 08 9217 5858
ABN: 29 113 023 591

9 December 2024

Dear Stakeholder

Consultation on Wandoo Field Exploration Drilling Environment Plan

Vermilion Oil and Gas Australia Pty Ltd (Vermilion) is planning to submit an Environment Plan for offshore oil exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L.

Location
The Wandoo Field is situated approximately 80 kilometres northwest of the port Dampier and 110 kilometres northeast of Barrow Island. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth in the range from 50-60 metres. Operational Areas have been defined as a subset of WA-14-L, to encompass the exploration prospects.

Drilling activities
Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

A Consultation Information sheet for the proposed activity is enclosed, providing additional background on the proposed activity, including summaries of potential key impacts and risks, and associated management measures. This is also available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Feedback
If you have feedback specific to the planned activity described under the proposed Environment Plan, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.**

Your feedback and our response will be included in the Wandoo Field Exploration Drilling Environment Plan, which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

Vermilion Oil and Gas Australia

4. Consultation Follow Up – January 2025

4.1. Email to Australian Border Force (ABF) (Maritime Border Command), Department of Energy, Mines, Industry Regulation and Safety (DEMIRS), Department of Industry, Science and Resources (DISR), Department of Biodiversity, Conservation and Attractions (DBCA), Ningaloo Coast World Heritage Advisory Committee (NCWHAC), Pilbara Development Commission (PDC), Protect Ningaloo, Australian Conservation Foundation (ACF), The Conservation Council of WA (CCWA), Care for Hedland on 13 January 2025

Dear Stakeholder

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 2 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.2. Email to Commonwealth Fisheries Association (CFA), Pearl Producers Association (PPA), Seafood Industry Australia (SIA), Tuna Australia, Western Rock Lobster Council (WRLC) on 13 January 2025

Dear Commercial Fishing Representative Body

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 2 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Information for the commercial fishing sector

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.

- Information about exclusionary zones and communication with fishers and mariners are included in the attached documents.
- Vermilion acknowledges WAFIC's consultation guidance and has applied this by consulting fisheries assessed as having a potential for interaction in the Operational Areas and EMBA via WAFIC. Vermilion has also consulted with AFMA.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.3. Email to Department of Agriculture, Forestry and Fisheries (DAFF) – Fisheries on 13 January 2025

Dear DAFF - Fisheries

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 2 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up

to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Information for the commercial fishing sector

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.
- Information about exclusionary zones and communication with fishers and mariners are included in the attached documents.
- Vermilion acknowledges WAFIC's consultation guidance and has applied this by consulting fisheries assessed as having a potential for interaction in the Operational Areas and EMBA via WAFIC. Vermilion has also consulted with AFMA.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.4. Email to Department of Agriculture, Forestry and Fisheries (DAFF) – Biosecurity (marine pests) (vessels, aircraft and personnel) on 13 January 2025

Dear DAFF – Biosecurity

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 3 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Biosecurity

With respect to the biosecurity matters, please note the following information below outlines our proposed biosecurity risk management to prevent the introduction of invasive marine species:

Environment Description and Assessment

The Operational Area is located in a deep-water (50-60 m) open-ocean environment that is ~63 km (34 nm) from the nearest shoreline and has a lack of hard substrate. Values and sensitivities of benthic habitats and communities within the Operational Area are limited to soft sediment benthic habitats that are widespread and homogenous in the North West Shelf (NWS). ROV surveys on the NWS, at similar water depths to those in the Operational Area, have indicated the seafloor is comprised of fine silt/sand substrates and benthic communities were generally sparse with low densities of organisms (e.g. crustaceans, molluscs, and polychaetes). Further, no key ecological features, often associated with provided hard substrate habitats are located within the Operational Area. Therefore, it is considered that the Operational Area does not provide a location conducive to marine pest establishment and survival, and that there is little potential for invasive organisms to accumulate and multiply. Displacement of native marine species or a reduction in abundance from predation, competition or interspecies breeding is not expected to occur.
Invasive Marine Species Prevention Controls

• Vessels will have an approved ballast water management plan and valid ballast water management certificate, unless an exemption applies or is obtained, as specified in the Australian Ballast Water Management Requirements.
• Vessels will complete a VOGA Biofouling Risk Assessment, identifying a low risk before mobilisation to the Operational Area:
  ○ Biofouling risk based on a range of information including presence of a biofouling management plan and record book, last port of call, age of anti-fouling coating etc. If a risk category of moderate, uncertain or high is scored, the process requires an independent IMS expert to be engaged and further risk assessment and/or management measures undertaken.
• Anti-fouling Systems on vessels are maintained in compliance with International Convention on the Control of Harmful Anti-Fouling Systems on Ships (IMO, 2001):
  ○ Prohibits the use of harmful organotins in antifouling paints used on ships and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems.

Yours sincerely

4.5. Email to Department of Defence (DoD) on 13 January 2025

Dear Department of Defence

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 2 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Defence

Vermilion has assessed all impacts and risks to Defence:

Wandoo Field Exploration Drilling Environment Plan: There are no Defence related uses within the Operational Area. The EMBA encompasses the military installations near Exmouth, including a naval communication station. The Department of Defence has several offshore training areas including the North West Exercise Area (NWXA) (approximately 95 km southwest of the Operational Area) and Learmonth Air Weapons Range (approximately 275 km west-southwest of the Operational Area) in the EMBA. These areas are used for Defence Force training exercises, including live firing. No unexploded ordnance (UXO) potential has been identified within the Operational Area.

Wandoo Field Geophysical and Geotechnical Environment Plan: There are no Defence related uses within the Operational Area. The EMBA encompasses the military installations near Exmouth, including a naval communication station. The Department of Defence has several offshore training areas including the North West Exercise Area (NWXA) (approximately 155 km southwest of the Operational Area) and Learmonth Air Weapons Range (approximately 330 km west-southwest of the Operational Area) in the EMBA. These areas are used for Defence Force training exercises, including live firing. No unexploded ordnance (UXO) potential has been identified within the Operational Area.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.6. Email to Department of Climate Change, Energy, the Environment and Water (DCCEEW) – Underwater Cultural Heritage (UCH) on 13 January 2025

Dear DCCEEW,

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 3 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Underwater cultural heritage

Vermilion has undertaken an assessment of underwater cultural heritage:

Wandoo Field Geophysical and Geotechnical Survey Environment Plan	There are no cultural heritage artefacts identified within the Operational Area or EMBA. There are no historical wrecks within the Operational Area or within a 100 km buffer of the EMBA. There are no registered Aboriginal cultural heritage sites within the Operational Area, 52 registered sites are present within the EMBA.

Wandoo Field Exploration Drilling Environment Plan	There are no cultural heritage artefacts identified within the Operational Area. The Australasian Underwater Cultural Heritage Database identified one historic underwater cultural heritage artefact within the EMBA. There are no historical wrecks within the Operational Area. However, there are 31 historical wrecks within a 100 km buffer of the EMBA. HMAS *Sydney II* and HSK *Kormoran* Shipwreck Sites are located within the EMBA. There are no registered Aboriginal cultural heritage sites within the Operational Area, 283 registered sites are present within the EMBA.

Vermilion also advises that it has contacted the West Australian Museum and the Department of Planning, Lands and Heritage (DPLH) as part of our consultation.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.7. Email to Department of Planning, Lands and Heritage (DPLH) on 13 January 2025

Dear DPLH,

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 3 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Underwater cultural heritage and historical wrecks

Vermilion has undertaken an assessment of underwater cultural heritage and historical wrecks:

Wandoo Field Geophysical and Geotechnical Survey Environment Plan	There are no cultural heritage artefacts identified within the Operational Area or EMBA. There are no historical wrecks within the Operational Area or within a 100 km buffer of the EMBA. There are no registered Aboriginal cultural heritage sites within the Operational Area, 52 registered sites are present within the EMBA.

Wandoo Field Exploration Drilling Environment Plan	There are no cultural heritage artefacts identified within the Operational Area. The Australasian Underwater Cultural Heritage Database identified one historic underwater cultural heritage artefact within the EMBA. There are no historical wrecks within the Operational Area. However, there are 31 historical wrecks within a 100 km buffer of the EMBA. HMAS *Sydney II* and HSK *Kormoran* Shipwreck Sites are located within the EMBA. There are no registered Aboriginal cultural heritage sites within the Operational Area, 283 registered sites are present within the EMBA.

Vermilion also advises that it has contacted the West Australian Museum and the Department of Climate Change, Energy, the Environment and Water (DCCEEW) as part of our consultation.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.8. Email to Department of Primary Industries and Regional Development (DPIRD) – Fisheries on 13 January 2025

Dear DPIRD

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 2 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Information for the commercial fishing sector

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.
- Information about exclusionary zones and communication with fishers and mariners are included in the attached documents.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.9. Email to Western Australian Museum (WAM) on 13 January 2025

Dear Western Australian Museum

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 3 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Underwater cultural heritage – historical shipwrecks

Vermilion has undertaken an assessment of historical shipwrecks:

Wandoo Field Geophysical and Geotechnical Survey Environment Plan	There are no historical wrecks within the Operational Area or within a 100 km buffer of the EMBA.
Wandoo Field Exploration Drilling Environment Plan	There are no historical wrecks within the Operational Area. However, there are 31 historical wrecks within a 100 km

	buffer of the EMBA. HMAS *Sydney II* and HSK *Kormoran* Shipwreck Sites are located within the EMBA.

Vermilion also advises that it has contacted the Department of Planning, Lands and Heritage (DPLH) as part of our consultation.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.10. Email to WA Game Fishing Association (WAGFA), Marine Tourism WA, Ashburton Anglers, Exmouth Game Fishing Club (EGFC), King Bay Game Fishing Club (KBFC), Nickol Bay Sportsfishing Club (NBSC) on 13 January 2025

Dear Stakeholder

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 2 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and

geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.11. Email to Beagle No. 1 Pty Ltd / Longreach Capital Investment, Chevron Australia, INPEX Browse E&P Pty Ltd, Jadestone Energy (Australia) Pty Ltd, Kato Energy (WA) Pty Ltd, Kufpec (Perth) Pty Ltd, MEO International Pty Ltd, Mobil Australia Resources Company Pty Limited, Santos Offshore Pty Ltd, Western Gas (474 P) Pty Ltd, Woodside Energy (Australia) Pty Ltd, Shell Australia Pty Ltd on 13 January 2025

Dear Titleholder

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 3 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-

L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.12. Email to Vocus Communications on 13 January 2025

Dear Vocus

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 3 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

4.13. Email to Western Australian Local Government Association (WALGA), Karratha and Districts Chamber of Commerce and Industry (KDCCI), Regional Development Australia (Pilbara) Karratha WA, Town of Port Hedland, Shire of Ashburton, Shire of Exmouth, Port Hedland Chamber of Commerce and Industry on 13 January 2025

Dear Stakeholder

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 3 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

4.14. Email to Onslow Chamber of Commerce and Industry on 13 January 2025

Dear Onslow Chamber of Commerce and Industry

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 18 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and

confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.15. Email to Curtin University (Centre for Marine Science and Technology), University of Western Australia (UWA), Commonwealth Scientific and Industrial Research Organsiation (CSIRO), Western Australian Marine Science Institution (WAMSI), Australian Institute of Marine Science (AIMS), Australian Marine Sciences Association (WA Branch) (AMSA) on 13 January 2025

Dear Research Institute

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 2 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Vermilion is also seeking your advice regarding any research activities that your instiution/organisation is undertaking that may overlap with our proposed activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.
Yours sincerely

4.16. Email to Australian Energy Producers (AEP) on 13 January 2025

Dear Australian Energy Producers

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 2 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.17. Email to West Coast Rock Lobster Managed Fishery on 13 January 2025

Dear West Coast Rock Lobster Fishery

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 18 December 2024.

Vermilion is planning to submit an Environment Plan for offshore oil exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up

to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Information for the commercial fishing sector

- Fisheries have been identified as relevant to the proposed activity based on fishing licence overlap and assessment of government fishing effort data (including Fishcube and AFMA) from recent years. A summary of the relevant commonwealth and state managed fisheries are included in the commercial fishing information sheet attached.
- We have identified potential impacts to active commercial fishers and the environment, which are also summarised in the commercial fishing information sheet attached. We have endeavoured to reduce these risks to an as low as reasonably practicable level.
- Information about exclusionary zones and communication with fishers and mariners are inlcuded in the attached docments.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely,

4.18. Email to EOG Resources Australia Pty Ltd, IPB WA 424P Pty Ltd, Pathfinder Energy Pty Ltd, Pilot Energy Limited, Triangle Energy (Operations) Pty Ltd, 3D Energi Limited, Bengal Energy Ltd on 13 January 2025

Dear Titleholder

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on [date].

Vermilion is planning to submit an Environment Plan for offshore oil exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling activities

Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.19. Email to Shire of Carnarvon, Shire of East Pilbara, Shire of Broome, Shire of Shark Bay, Shire of Northampton, Broome Chamber of Commerce and Industry on 13 January 2025

Dear Stakeholder

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 3 December 2024.

Vermilion is planning to submit an Environment Plan for offshore oil exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin operating at a water depth in the range from 50-60 metres.

Drilling activities: Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

4.20. Letter sent to Pilbara Kimberley Recreational Marine Users and Gascoyne Recreational Marine Users on 14 January 2025

VERMILION
OIL & GAS
AUSTRALIA PTY LTD

LEVEL 5
30 THE ESPLANADE
PERTH
WESTERN AUSTRALIA 6000

TEL: 08 9217 5858
ABN: 29 113 023 591

13 January 2025

Dear Stakeholder

Consultation on Wandoo Field Geophysical and Geotechnical Survey Environment Plan & Exploration Drilling Environment Plan

This letter follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence.

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 9 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on Proposed Activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

Vermilion Oil and Gas Australia

4.21. Email to Australian Maritime Safety Authority (AMSA) – marine pollution on 13 March 2025

Dear [redacted],

This email follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence (included below).

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 2 December 2024.

Vermilion is planning to submit two Environment Plans for offshore survey and exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Survey Activities: Vermilion is preparing for near-field exploration drilling to identify and confirm viable hydrocarbons to support further development of the Wandoo Field. A geotechnical and geophysical survey is required to evaluate the environment at the proposed drilling locations and confirm suitability for a mobile offshore drilling unit, as per the Wandoo Field Geophysical and Geotechnical Survey Environment Plan.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plans to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on proposed activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858.

Vermilion will be closing feedback for these two EPs soon:

1. Wandoo Field Geophysical Geotechnical Survey Environment Plan on 19 March 2025
2. Wandoo Field Exploration Drilling Environment Plan on 25 April 2025.

Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely

Vermilion Oil & Gas Australia

E: abu.consultation@vermilionenergy.com

4.22. Letter sent to West Coast Recreational Marine Users on 14 January 2025

VERMILION
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LEVEL 5
30 THE ESPLANADE
PERTH, WESTERN AUSTRALIA 6000

TEL: 08 9217 5858
ABN: 29 113 023 591

13 January 2025

Dear Stakeholder

Consultation on Wandoo Field Exploration Drilling Environment Plan

This letter follows Vermilion Oil and Gas Australia Pty Ltd (Vermilion)'s previous correspondence.

We are writing to follow up on any feedback you may have regarding the proposed activities outlined in the consultation information sent to you on 9 December 2024.

Vermilion is planning to submit an Environment Plan for offshore exploration drilling activities to support continued production from the Wandoo Field in production licence area WA-14-L. The proposed activities will occur in Commonwealth waters within the Carnarvon Basin, operating at a water depth of 50-60 metres.

Drilling Activities: Vermilion has performed seven drilling campaigns over the life of the field and plan to drill one near-field exploration well in late 2025. Pending the results, Vermilion may drill up to four subsequent near-field exploration wells over the next five years within WA-14-L, as per the Wandoo Field Exploration Drilling Environment Plan.

Feedback on Proposed Activities: We are consulting with relevant persons who may be affected by these activities. Consultation information sheets are attached and available on our website at www.vermilionenergy.com/our-operations/australia/wandoo-consultation-activities.

Seeking Your Input: If you have feedback specific to the proposed activities described under the proposed Environment Plans, we would welcome your feedback at abu.consultation@vermilionenergy.com or (08) 9217 5858 by **17 January 2025.** Feedback can also be provided after the consultation period closes, throughout the life of an Environment Plan, as part of ongoing consultation.

Your feedback and our response will be included in our Environment Plans which will be submitted to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA) for acceptance in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023* (Cth).

Please let us know if your feedback for this activity is sensitive and we will make this known to NOPSEMA upon submission of the Environment Plan in order for this information to remain confidential to NOPSEMA.

Yours sincerely
Vermilion Oil and Gas Australia

1.4.3. Public Comment Report

The Public Comment Period for the Wandoo Facility Exploration Environment Plan on the NOPSEMA website, ran from 15 September 2025 – 15 October 2025.

One comment was received and assessed as not relevant.

#	Comments received	Titleholder response
1	What age can people start the job in an oil rig?	The comment is not relevant to the Environment Plan or intended outcome of consultation.

Appendix G Greenhouse Gas (GHG) Emissions Technical Note

Vermilion Oil & Gas Australia Pty Ltd

Wandoo Field Exploration Drilling Environment Plan

Greenhouse Gas (GHG) Emissions Technical Note

ASSIGNMENT P100489-S00
DOCUMENT P-100489-S00-A-REPT-001

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REVISIONS & APPROVALS

REV	DATE	DESCRIPTION	ISSUED	CHECKED	APPROVED	CLIENT
I01	03/06/2025	Issued for Information	FC	MH	AR	MJ
R01	21/03/2025	Issued for Review	FC	MH	AR	

CONTENTS

1 INTRODUCTION

Vermilion Oil & Gas Australia Pty Ltd (VOGA) currently operates the Wandoo Oilfield within WA-14L, located in Commonwealth waters in the Carnarvon Basin off the northwest coast of Western Australia (WA), approximately 80 km northwest of Dampier and 110 km northeast of Barrow Island.

VOGA is planning near field exploration drilling. The exploration drilling will be carried out using a Mobile Offshore Drilling Unit (MODU) at up to 7 prospect locations, all within WA-14-L. An Environment Plan (EP) has been prepared to allow for the exploration drilling and support activities.

The activities covered in the EP include:

- MODU: includes positioning, and general (non-drilling) operation activities
- Drilling: includes drilling and contingency activities
- Formation evaluation: reservoir appraisal activities
- Well abandonment: plug and abandonment activities, including wellhead removal
- Field support: includes support vessels, helicopters and Remotely Operated Vehicles (ROVs).

This Greenhouse Gas (GHG) Emissions Technical Note has been prepared from material provided in the EP, with the purpose of assessing all scopes of GHG emissions generated from the exploration drilling activities.

2 BOUNDARY OF ASSESSMENT

The GHG emissions assessment includes GHG emissions generated from all planned activities that will occur within the Operational Area (OA), defined based on 4 km x 4 km squared around each prospect location (the prospect areas for North of Wandoo 2 and Kullingal are smaller than 4 km x 4 km to ensure they are limited to the permit area), and encompasses a 500 m safety exclusion zone that will be requested around the MODU for the duration of activities.

The exploration drilling activities are planned to commence in 2026-2027 (pending MODU and vessel availability, regulatory approvals, or other VOGA project requirements). The activity is estimated to take 10-15 days of drilling per well and 2 days of plug and abandonment per well. The EP allows for up to seven exploration wells to be drilled. The initial campaign will comprise one well. Subsequent campaigns (if any) may include up to two wells per campaign.

The above durations do not include vessel transit times, potential delays caused by ocean conditions, weather downtime, standby and equipment failure or other delays relative to the petroleum activity plan, as these factors are difficult to predict or quantify. Should additional time be required to complete the exploration drilling, VOGA will assess the situation in accordance with the VOGA Management of Change (MoC) Procedure. For the GHG emissions assessment, a factor of 20% is used to account for the schedule and weather contingencies.

The GHGs included in the emissions assessment are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), and specified kinds of hydrofluorocarbons and perfluorocarbons, as defined in the National Greenhouse and Energy Reporting (NGER) Scheme (CER, 2024). No SF6 and specified kinds of hydrofluorocarbons and perfluorocarbons are expected to be generated from the activities.

The GHG emissions assessment covers all emission scopes—scopes 1, 2 and 3, defined as:

- Scope 1: The GHG emissions released as a direct result of VOGA's exploration drilling activities. In this case, scope 1 will be zero as there is no gas or oil flaring expected from the activities. Fuel use by the MODU and vessels is not included in scope 1 emissions.
- Scope 2: The indirect GHG emissions from the generation of electricity, steam, heating and cooling purchased. Scope 2 will be zero as there is no purchased electricity/energy involved.
- Scope 3: The indirect GHG emissions from VOGA's exploration drilling activities, not including scope 2, e.g., fuel use by MODU and vessels, purchased goods and services (support operations, materials).

The GHG emission sources and scope included in the assessment and relevant to the activities are summarised in

Table 2-1. Emissions from fugitives and employee commuting (road travel and fixed wing aircraft) are assumed to be immaterial. There is no recovery of hydrocarbons associated with the exploration drilling activities, and as such no processing, transport, or third party end-use of hydrocarbons would occur as a result of the petroleum activity within scope of the EP and GHG emissions assessment.

Table 2-1: Emission sources and scopes included in the GHG assessment

EMISSION SCOPE	EXPLORATION DRILLING ACTIVITIES
Scope 1	Immaterial fugitive emissions; no other sources
Scope 2	Not applicable
Scope 3	• Support operations, including vessels[1] and helicopters • Materials[2] • Waste generated[3]

[1] Include vessels and MODU activities within the OA only, as per the EP scope.
[2] Include embodied carbon for the major items only – cement, casing, and water-based mud (WBM).
[3] Include landfilling of the wellhead retrieved assuming immaterial emissions from waste discharge.

Activities excluded from the scope of the EP and GHG emissions assessment are:

- Vessel operations within Port Boundaries or State waters given they are managed under the *Shipping and Pilotage Act 1967* (WA) as administered by the relevant Port Authority under the *Port Authorities Act 1999* (WA)
- Vessel operations within Commonwealth waters outside of the Operational Areas/Petroleum Activity Area given they are managed under the *Navigation Act 2012 (Cth)* as administered by the Australian Maritime Safety Authority (AMSA).

3 METHODOLOGY

GHG emissions are estimated according to the methodologies in NGER Determination 2008 and GHG Protocol Corporate Value Chain (Scope 3) Standard, as summarised in Table 3-1.

Table 3-1: GHG emissions estimation methods

CATEGORY	EMISSION SCOPE	EMISSION ESTIMATION METHOD
Support operations	Scope 3	• Vessel and helicopter fuel consumption data provided by VOGA if applicable, and from Xodus database for the unavailable data • For vessel operations: the emission factor of 'Diesel oil' taken from NGER Determination 2008, Division 4.1, Item 54 • For helicopter operations: the emission factor of 'kerosene for use as fuel in an aircraft' taken from NGER Determination 2008, Division 4.1, Item 56 • Emissions estimated using the equation: Emission factor (t CO_2-e/m^3) x Activity data (m^3).
Materials	Scope 3	• For cement: the emission factor of 'Cement – General (UK average)' taken from the Inventory of Carbon and Energy (ICE Database V4) • For casing: the emission factor of 'Steel, Stainless' taken from ICE Database V4 • Emissions estimated using the equation: Emission factor (t CO_2-e/t) x Activity data (t).
Waste	Scope 3	The emission factor of 'Commercial and industrial waste disposal' taken from the National Greenhouse Accounts Factors (DCCEEW, 2024) and emissions estimated with the equation: Emission factor (t CO_2-e/t) x Activity data (t).

The info and assumptions used in the GHG emissions assessment are listed below:

General

- A contingency factor of 20% is included when estimating the wait-on-weather emissions from vessel and helicopter operations, to account for potential delays caused by ocean conditions, weather downtime, standby and equipment failure or other delays relative to the petroleum activity plan.
- Immaterial emissions from road commuting and aircraft travel.

Well Drilling and Plug and Abandonment (P&A)

- The MODU used will be a jack-up drilling rig, up to 150 Persons on Board (POB), fuel consumption of 12~18 m^3/d (18 m^3/d is used in GHG emissions assessment).
- Well drilling and P&A are assumed to take a maximum of 119 days, including contingencies.
- No gas flared during well testing/completions and well P&A.

- No oil flared during well testing/completions and well P&A.
- Only water-based mud (WBM) will be used for the well.
- Immaterial venting emissions from the MODU storage tanks during bulk transfer.

Support Operations

- Two AHTS support vessels (each up to 52 POB, with typical crew of 15 persons) are typically contracted for the duration of each campaign. A third vessel of similar or lesser specs may also be used during rig moves and to provide additional logistical support. In the GHG emissions assessment, total of 3 AHTS support vessels are included for each campaign. The AHTS has the following fuel consumptions:
  - Standby: 6 m^3/d
  - Economic speed: 13 m^3/d
  - Max speed: 50 m^3/d.
- Formation evaluation involves vertical seismic profiling (VSP) which will take 4 hours with the MODU.
- As diesel fuel transfers from AHTS supply vessels to the MODU or the WNB platform will take place approx. once a week during the period spent on location, it is assumed that two AHTS support vessels will traverse the OA once a week.
- Helicopter operations will be based out of the Karratha Airport.
- Helicopter flights are expected to be approx. 6~7 times to the MODU each week during well construction activities (7 helicopter flights per week is used in the GHG emissions assessment).
- Helicopter refuelling on the MODU is not planned while it is jacked up on location in the OA.

Materials and Waste

- Only cement, WBM and casing are considered in the GHG emissions assessment.
- The amounts of major materials required during well drilling are assumed to be:
  - 45 m^3 of cement/well
  - 200 m^3 of WBM/well
  - 45 t of carbon steel casing/well.
- The amounts of major materials required during well P&A are assumed to be:
  - 50 m^3 of cement/well
  - 50 m^3 of WBM/well
  - Negligible carbon steel casing used.
- It is assumed the emissions from waste discharged at sea are immaterial and the retrieved wellheads (carbon steel) are assumed to weigh ~20 t/well which will be transported onshore for landfilling.

4 RESULTS

The total GHG emissions resulting from the activities are expected to be approximately 28 kt CO_2-e, consisting of entirely scope 3 emissions (Table 4-1).

The support operations (vessels and helicopter) are expected to generate approximately 22 kt CO_2-e, ~81% of the total GHG emissions. The vessel and helicopter emissions have included a contingency factor of 20% to account for the potential delays from the schedule and weather.

Table 4-1: Summary of the GHG emissions assessment results.

Emissions Source	Total (scope 3) Emissions	Percentage
	kt CO_2-e	%
Drilling Activities	**5.2**	**18.8**
Materials[1]	5.0	18.1
Waste[2]	0.2	0.7
Support Operations	**22.5**	**81.2**
Vessels[3]	22.3	80.5
Helicopter[4]	0.2	0.7
Total GHG Emissions (kt CO_2-e)	**27.7**	**100.0**

[1] Major materials required for both well drilling and well P&A: 95 m^3 cement/well; 45 t carbon steel casing/well; and 250 m^3 WBM/well.

[2] Weight of wellhead retrieved for landfill: 140 tonnes in total.

[3] Only MODU and vessel operations within OA considered; Jack-up MODU used for well drilling and P&A with 3 AHTS; Drilling and P&A durations up to a total of 119 days; VSP with the MODU for 4 hours.

[4] Helicopter flights 7 times a week on average during drilling and P&A activities, departing from Karratha Airport.

5 REFERENCES

CER, 2024, Emissions and energy types, Clean Energy Regulator, Australian Government, https://cer.gov.au/schemes/national-greenhouse-and-energy-reporting-scheme/about-emissions-and-energy-data/emissions-and-energy-types (Assessed on 4 March 2025).

DCCEEW, 2024. National Greenhouse Accounts Factors, Department of Climate Change, Energy, the Environment and Water, Australian Government, https://www.dcceew.gov.au/climate-change/publications/national-greenhouse-accounts-factors (Assessed on 4 March 2025).

Appendix H Historical Shipwrecks

Table H1: Historical shipwrecks and artefacts located within the Project Areas

Historical shipwreck or artefact	Year wrecked	Distance from Operational Area (km)	Project Areas		
			Operational Area	Hydrocarbon Area	EMBA
19 mile unidentified	Unknown	501.6	-	-	✓
Agnes	1893	292.3	-	✓	✓
Airlie	1889	224.6	-	-	✓
Alexandra	1872	844.0	-	-	✓
Alfred	1908	417.5	-	-	✓
Alice	1891	56.7	-	-	✓
Anxiety	1898	635.3	-	-	✓
Arab	1921	844.0	-	-	✓
Arabian	1872	844.0	-	-	✓
Barbara Gay	1962	844.0	-	-	✓
Beagle	1904	678.7	-	-	✓
Beatrice	1899	292.6	-	✓	✓
Bell	1893	292.3	-	✓	✓
Benan	1888	395.8	-	-	✓
Bertha	1874	394.5	-	✓	✓
Beryl Joyce	1957	844.0	-	-	✓
Bronlon	1933	571.8	-	-	✓
Bronton	1933	566.1	-	-	✓
Cheryl D	1962	844.0	-	-	✓
Chofuku Maru	1931	379.6	-	✓	✓
Cock Of The North	1879	394.5	-	✓	✓
Correio da Azia	1816	400.4	-	-	✓
Cossack	1889	224.6	-	-	✓
Cossack Explosives jetty	N/A	97.6	-	-	✓
Cossack Unidentified 7	N/A	97.6	-	-	✓
Cossack Wharf and seawall	N/A	97.3	-	-	✓

Historical shipwreck or artefact	Year wrecked	Distance from Operational Area (km)	Project Areas		
			Operational Area	Hydrocarbon Area	EMBA
Crighton	1921	635.3	-	-	✓
Crown of England	1912	143.6	-	-	✓
Curlew	1911	123.2	-	✓	✓
Dampier	Unknown	38.2	-	✓	✓
Depuch Island inscriptions and graves	N/A	142.3	-	-	✓
Deus Te Guie	1965	1177.0	-	-	✓
Don Joseph	1899	391.8	-	✓	✓
Eddystone	1894	143.2	-	-	✓
Edith	1907	303.7	-	-	✓
Elizabeth	1893	292.3	-	✓	✓
Ellen	1893	292.3	-	✓	✓
Emlyn Castle	1960	287.7	-	✓	✓
Emma	1867	419.3	-	-	✓
Era	1928	844.0	-	-	✓
Fairy Queen	1875	288.0	-	✓	✓
Fin	1923	392.0	-	✓	✓
Florence	1893	292.3	-	✓	✓
G.G.S.	1883	394.5	-	✓	✓
Gem	1893	292.6	-	✓	✓
Genesta	1909	622.7	-	-	✓
Gift	1898	635.3	-	-	✓
Haw Kiet	2003	198.0	-	-	✓
Hawk	1896	369.2	-	-	✓
Helena Mena	1898	675.5	-	-	✓
Idahlia	1898	635.3	-	-	✓
Iona	1923	403.4	-	✓	✓
Jane Bay Two Unidentified	N/A	390.7	-	-	✓
Judith Ann	1972	844.0	-	-	✓
Julie Dawn	1971	844.0	-	-	✓

Historical shipwreck or artefact	Year wrecked	Distance from Operational Area (km)	Project Areas		
			Operational Area	Hydrocarbon Area	EMBA
Junee	1967	844.0	-	-	✓
Just In Time	1898	635.3	-	-	✓
Kadna	1902	492.1	-	-	✓
Kapala	1964	292.3	-	✓	✓
Koombana	1912	265.8	-	-	✓
Korda	1945	529.9	-	-	✓
Kormoran HSK	1941	839.2	-	-	✓
Lady Ann	1982	261.0	-	✓	✓
Lamareaux	1893	292.3	-	✓	✓
Leave	1893	292.3	-	✓	✓
Lily Of The Lake	1875	292.3	-	✓	✓
Lively	1810	467.3	-	-	✓
Lorna Doone	1923	432.9	-	-	✓
Mabel	1893	292.3	-	✓	✓
Maratta	1905	113.4	-	✓	✓
Marietta	1905	123.2	-	✓	✓
Marutta	1905	113.4	-	✓	✓
Mary B	1920	245.0	-	-	✓
Mauds Landing	N/A	419.1	-	-	✓
May	1872	844.0	-	-	✓
McCormack	1989	40.6	-	✓	✓
McDermott Derrick Barge No 20	1989	40.6	-	✓	✓
Mildura	1907	287.5	-	✓	✓
Min Pin Liu No. 25 (*Also Ming Pin Liu*)	1999	198.8	-	-	✓
Moyne	1957	844.0	-	-	✓
Nellie	1893	292.3	-	-	✓
Norwegian Bay Unidentified Barge	Unknown	384.6	-	-	✓
Occator	1856	370.6	-	✓	✓

Historical shipwreck or artefact	Year wrecked	Distance from Operational Area (km)	Project Areas		
			Operational Area	Hydrocarbon Area	EMBA
Olive	1916	625.2	-	-	✓
Olive	1893	292.3	-	✓	✓
Onslow Jetty	N/A	205.0	-	-	✓
Orson	1996	95.5	-	-	✓
Parks Lugger	Unknown	91.8	-	✓	✓
Patience	1959	844.0	-	-	✓
Patience	1930	532.5	-	-	✓
Pearl	1896	292.3	-	✓	✓
Pearl	1920	253.1	-	-	✓
Pelsart (Pelsaert)	1908	417.5	-	-	✓
Perentie	1976	113.4	-	✓	✓
Perseverant's Boat	1841	635.3	-	-	✓
Perseverant's Boat	1841	635.3	-	-	✓
Perth	1887	394.3	-	✓	✓
Plym HMS	1952	85.6	-	-	✓
Point Cloates Unidentified	Unknown	400.0	-	-	✓
Point Sampson	Unknown	95.3	-	-	✓
Point Samson Unidentified	Unknown	95.4	-	-	✓
Puffin	1964	844.0	-	-	✓
Queen	1891	394.5	-	✓	✓
Rapid	1811	394.3	-	-	✓
Rita	1971	574.1	-	-	✓
Rose	1908	220.5	-	✓	✓
Rosella	1928	844.0	-	-	✓
Ruby	1893	292.3	-	✓	✓
S.S.S.	1901	395.5	-	✓	✓
Scout	1918	844.0	-	-	✓
Sea Queen	1893	292.3	-	✓	✓
Seagull	1893	635.3	-	-	✓

Historical shipwreck or artefact	Year wrecked	Distance from Operational Area (km)	Project Areas		
			Operational Area	Hydrocarbon Area	EMBA
See Taube	1954	417.5	-	-	✓
Shunsei Maru	1931	370.6	-	✓	✓
Smuggler	1893	292.3	-	✓	✓
Solveig	1903	94.9	-	-	✓
Star	1876	654.9	-	-	✓
Stefano	1875	399.2	-	-	✓
Strathmore	1870	394.5	-	✓	✓
Sydney HMAS	1941	852.2	-	-	✓
Tanami	1935	103.4	-	✓	✓
The Two Friends	1925	675.5	-	-	✓
Tifera	1923	432.9	-	-	✓
Trial	1622	102.6	-	✓	✓
Tropic Queen	1975	93.0	-	✓	✓
Unidentified Lugger	1893	292.3	-	✓	✓
Unidentified Luggers (Various)	1883	844.0	-	-	✓
Vergo	1893	635.3	-	-	✓
Veronica	1928	263.0	-	✓	✓
Vianen	1628	123.2	-	✓	✓
Viking	1958	844.0	-	-	✓
Vittoria	1929	622.7	-	-	✓
Wild Wave	1875	292.3	-	✓	✓
Wild Wave (China)	1873	123.2	-	✓	✓
Wyndham	1910	394.5	-	✓	✓
Yule	1922	211.4	-	-	✓
Zelma	1990	52.0	-	✓	✓
Zvir	1902	389.2	-	✓	✓

Appendix I Critical Procedure Performance Standard: Element 8 – Oil Spill Response

CRITICAL PROCEDURE PERFORMANCE STANDARD

VERMILION

TITLE:	ELEMENT 8 – OIL SPILL RESPONSE		
CODE:	WAN-WNAB-CP-ER-02 and WAN-WNAB-CP-ER-03	**RESPONSIBLE**	Managing Director
GOAL:	To mitigate the environmental impacts as a result of oil spill.		
OBJECTIVE:	To ensure that measures are in place to mitigate the oil spill hazards associated with activities within the Wandoo Field.		
MAEs & CEEs:	All CEEs		
SCOPE:	**Inclusions:**		
	• Covers oil spill response arrangements for all activities within the Wandoo Field.		
	Exclusions:		
	• Excludes oil spill response not associated with activities within the Wandoo Field.		

FUNCTIONALITY

Key Component	Key Requirement	Performance Criteria	Assurance Activity	Reference
WAN-WNAB-CP-ER-02-01 Oil Spill Response (OSR) Arrangements	The Wandoo Field Oil Spill Contingency Plan (OSCP) and Exploration and Survey Operations Oil Pollution Emergency Plan (OPEP) are established to mitigate the oil spill hazards identified in the respective Environment Plans.	• The Wandoo Field OSCP and Exploration and Survey Operations OPEP reflects the credible oil spill hazards (volume, duration and potential impact) associated with petroleum activities as outlined within the respective Environment Plans. • To ensure that the loss of well control hazard for any new wells proposed in Wandoo Field remain within the worst-case discharge parameters (volume, duration and potential impact), new wells will be assessed using reservoir modelling prior to drilling. • The Wandoo Field OSCP and Exploration and Survey Operations OPEP considers oil spill hazards within the context of the seasons for which the petroleum activity occurs, as described in the Environment Plans. • All oil spill hazards identified in the Environment Plans are covered by an Oil Pollution Plan (OPP) within the Wandoo Field OSCP and Exploration and Survey Operations OPEP.	• Accepted Wandoo Field OSCP [WAN-2000-RD-0001]. • Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-0016].	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
	Response strategies provided in the OPPs are appropriate to: • The nature and scale and associated environmental impact of the potential spill hazards • The nature and scale and associated environmental impact of the potential spill response strategies • The environmental sensitivities and priorities as outlined within the respective Environment Plans.	• Response strategies described in the OPPs shall take into consideration the range of potential impacts from the spill events including: ○ Minimum time to contact ○ Maximum length of shoreline contacted ○ Maximum volume of oil ashore ○ Geographical range of the trajectory of oil ○ Environmental sensitivities as outlined within the respective Environment Plans and their prioritisation based on recovery rates and uniqueness.	• Accepted Wandoo Field OSCP [WAN-2000-RD-0001]. • Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-0016].	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
		• The OPPs shall take into consideration the range of potential impacts from the identified response strategies including: ○ The range of potential impact and recovery time for the environmental sensitivities. ○ Measures to reduce, manage or monitor environmental impact from the response as outlined within the respective Environment Plans. ○ Event/scenario specific environmental impact assessment of the spill and response activities prior to site implementation via Spill Impact Mitigation Assessment.	• Accepted Wandoo Field OSCP [WAN-2000-RD-0001]. • Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-0016].	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
	The Wandoo Field OSCP and Exploration and Survey Operations OPEP describes incident management system and interfaces.	• Organisational structure and roles and responsibilities of Incident Control Team (ICT) members are defined in the Wandoo Field OSCP and Exploration and Survey Operations OPEP. • Interfaces between the VOGA ICT and the command teams representing State and Commonwealth Oil Spill Response Agencies are described in the Wandoo Field OSCP and Exploration and Survey Operations OPEP.	• Accepted Wandoo Field OSCP [WAN-2000-RD-0001]. • Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-0016].	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
	Decision making processes support mitigation of environmental impact of spills and assessment of effectiveness of response strategies.	• The Wandoo Field OSCP and Exploration and Survey Operations OPEP shall provide a process for completing an Incident Action Plan (IAP) which shall include: ○ An environmental impact assessment of the proposed response activities ○ Selection of the most appropriate response activities (strategies) ○ Identification of appropriate operational and scientific monitoring activities ○ Operational and scientific monitoring outputs shall inform the effectiveness of response strategies.	• Accepted Wandoo Field OSCP [WAN-2000-RD-0001]. • Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-0016].	• Wandoo Field OSCP [1]
	The Wandoo Field OSCP and Exploration and Survey Operations OPEP shall contain processes to assess, test and maintain arrangements to meet the outcomes through: • Assurance processes • Capability assessment	• Regular inspections and audits to ensure arrangements outlined shall be in place. • Response requirements for equipment and personnel shall be assessed throughout the duration of a worst-case spill event response. • Emergency contacts directory is maintained with current and relevant contact details for oil spill response. • Oil Spill Response Capability Review [VOG-7000-RH-0009] updated annually to ensure oil spill response capabilities stated in the relevant Environment Plans, OSCP and OPEP are maintained.	• Inspections of third-party providers undertaken in accordance with the Wandoo Field OSCP Part 3: Performance Management [WAN-2000-RD-0001] and the Exploration and Survey Operations OPEP Part 3 Performance Management [AUPD24001-VOG-1100-0016].	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]

FUNCTIONALITY				
Key Component	**Key Requirement**	**Performance Criteria**	**Assurance Activity**	**Reference**

	• Review triggers.	• Oil spill response exercises shall:
		  ○ Provide situational experience to ICT personnel and enabling them to be aware of their assigned roles and responsibilities during a response
		  ○ Assesses the effectiveness, achievability and timeliness of incident action planning for the duration of expected response
		  ○ Test interfaces between teams and deployment of equipment and resources.
			• Oil spill response exercises shall be undertaken in accordance with Table 8-2 of the Wandoo Field OSCP [WAN-2000-RD-0001] and Table 8-2 of the Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-0016].
			• Oil Spill Response Capability Review [VOG-7000-RH-0009] contains up-to-date capability assessment of equipment and personnel.
				• Wandoo Field OSCP [1]
				• Exploration and Survey Operations OPEP [2]
				• Oil Spill Response Capability Review [3]

		• The Wandoo Field OSCP and Exploration and Survey Operations OPEP shall identify review triggers linked to significant changes to spill risk profile and availability of equipment and personnel required within the OPPs.	• Accepted Wandoo Field OSCP [WAN-2000-RD-0001]. • Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-0016].	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
WAN-WNAB-CP-ER-02-02 Resources defined and available in a timely manner	Equipment, services and personnel required for the first 20 days are identified within the OPPs.	• Training and competency requirements of key response personnel and contractors shall be defined. • Capability assessment shall be conducted to ensure the availability of equipment and personnel within the desired timeframe.	• Accepted Wandoo Field OSCP [WAN-2000-RD-0001]. • Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-0016]. • Oil Spill Response Capability Review [VOG-7000-RH-0009] contains up-to-date capability assessment of equipment and personnel.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2] • Oil Spill Response Capability Review [3]
	A logistics management plan is in place to inform deployment of resources in a timely manner.	• A logistics management plan for oil spill response shall identify resources and activation procedures to ensure a timely activation.	• Emergency Response Logistics Management Plan [VOG-7000-RH-0008].	• Emergency Response Logistics Management Plan [VOG-7000-RH-0008]

	Contracts are established for equipment and services for the full duration of a response.	• Contracts must be established for the full duration of a response if:
		  ○ Services are required to be utilised during the first 20 days of proposed response activities, or
		  ○ The contract is deemed to take longer than 20 days to initiate following a spill.
			• Signed third party provider contracts.	• Oil Spill Response Capability Review [3]
				• HSEMS Element 12 – Performance Assessment Manual [4]

WAN-WNAB-CP-ER-03-01 Response Strategy - Monitor and evaluate	Ensure the most effective response strategies are being applied and environmental impact of the spill and response strategies are measured.	• Monitoring shall be activated from time of spill detection to inform implementation of response strategies. • Platform observations commence immediately following the detection of a spill. • Visual observations from chartered vessel to be mobilised immediately following the detection of a spill. • Aerial observations to be initiated within 2 hours of spill being reported (daylight only). • Satellite imagery to be initiated within 2 hours of a spill being reported. • Preliminary Oil Spill Trajectory Modelling (OSTM) to be requested within 3 hours of a spill being reported. • Satellite tracking buoys to be deployed within 30 minutes of a spill being reported. • Tracking buoys data will be monitored and interrogated at least once every 24 hours. • OSTM to continue until the termination criteria is met. • Operational monitoring shall be available to inform IAP process prior to implementation of strategies that have an environmental impact (e.g. dispersant application). • Environmental data to support decision making (IAP) and spill impact assessment shall be available prior to impact. • Shoreline Clean-up Assessment Technique (SCAT) teams will complete surveys before clean-up teams' complete assignments so that priority locations are identified, and suitable techniques are used.	• Oil Spill Response Capability Review [VOG-7000-RH-0009] contains up-to-date capability assessment of equipment and personnel. • Inspections of third-party providers undertaken in accordance with the Wandoo Field OSCP Part 3: Performance Management [WAN-2000-RD-0001] and Exploration and Survey Operations OPEP Part 3 Performance Management [AUPD24001-VOG-1100-0016]. • IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2] • Oil Spill Response Capability Review [3] • HSEMS Element 12 – Performance Assessment Manual [4]
WAN-WNAB-CP-ER-03-02 Response Strategy - Chemical dispersant application	Increase the rate of biodegradation to reduce the environmental impact from surface oil and oil stranding on shoreline sensitivities.	• Dispersant application (aerial and marine) shall be available to be deployed when Wandoo Crude is most amenable to dispersant for the most effective results. • Establish an aerial and marine operating base and within 24 hours. • Aerial dispersant will be available to be applied within 30 hours. • Marine dispersant will be available to be applied within 24 hours. • Use of the most effective chemical dispersant to treat Wandoo Crude. • Sufficient dispersant available to be applied within the dispersant application zone.	• Dispersant efficacy testing results on Wandoo Crude. • Oil Spill Response Capability Review [VOG-7000-RH-0009] contains up-to-date capability assessment of equipment and personnel. • Inspections of third-party providers undertaken in accordance with the Wandoo Field OSCP Part 3: Performance Management [WAN-2000-RD-0001] and Exploration and Survey Operations OPEP Part 3 Performance Management [AUPD24001-VOG-1100-0016].	• Oil Spill Response Capability Review [3] • HSEMS Element 12 – Performance Assessment Manual [4]

FUNCTIONALITY				
Key Component	**Key Requirement**	**Performance Criteria**	**Assurance Activity**	**Reference**

	Minimise environmental impacts associated with dispersant application.	• Spill Impact Mitigation Assessment undertaken prior to dispersant usage.
		• Use of Oil Spill Control Register (OSCA) approved dispersants only.
		• No dispersant applied within the vicinity of protected marine fauna (based on fauna observations as per Operational and Scientific Monitoring Bridging Implementation Plan [VOG-1100-RG-0002]).
		• Dispersant Application Zone in place that excludes the following areas from the spraying of dispersant:
		  ○ Waters shallower than 20 m (lowest astronomical tide)
		  ○ Within 4 km of Coastal Waters maritime boundary
		  ○ Within 10 km of Australian Marine Parks (excluding Multiple Use Zones)
		  ○ Within 10 km of State Marine Protected Areas
		  ○ Within 10 km of World National and Commonwealth Heritage List areas
		  ○ Within 10 km of sensitive receptors (e.g. Glomar Shoals and Rankin Bank).
			• IAP records.
			• Accepted Wandoo Field OSCP [WAN-2000-RD-0001].
			• Accepted Exploration and Survey Operations OPEP [AUPD24001-VOG-1100-0016].
			• Oil Spill Response Capability Review [VOG-7000-RH-0009] contains up-to-date capability assessment of equipment and personnel.
				• Wandoo Field OSCP [1]
				• Exploration and Survey Operations OPEP [2]

WAN-WNAB-CP-ER-03-03 Response Strategy - Mechanical dispersant application	Assist natural dispersion of oil into the water column to reduce environmental impact from surface oil.	• Mechanical dispersion is a secondary strategy that will be used opportunistically based on IAP outcomes.	• IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
	Minimise environmental impacts associated with mechanical dispersant activities.	• Mechanical dispersion shall only be undertaken in water deeper than 20 m.	• IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
WAN-WNAB-CP-ER-03-04 Response Strategy - Containment and recovery	Reduce overall volume of surface oil to minimise impacts to environmental sensitivities.	• Containment and recovery resources will be available to be deployed within 48 hours • Equipment available for containment and recovery will be suitable for the hydrocarbon type, and access to equipment will be maintained. • Waste storage and transport plan will be developed within 72 hours of the spill event. • Temporary waste storage equipment and arrangements will be maintained.	• Oil Spill Response Capability Review [VOG-7000-RH-0009] contains up-to-date capability assessment of equipment and personnel. • Inspections of third-party providers undertaken in accordance with the Wandoo Field OSCP Part 3: Performance Management [WAN-2000-RD-0001] and Exploration and Survey Operations OPEP Part 3 Performance Management [AUPD24001-VOG-1100-0016]. • IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2] • Oil Spill Response Capability Review [3] • HSEMS Element 12 – Performance Assessment Manual [4]
	Minimise environmental impacts associated with improperly deployed equipment.	• Deployments shall be undertaken by trained incident response personnel.	• IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
WAN-WNAB-CP-ER-03-05 Response Strategy - Protection and deflection	Minimise environmental impacts to priority near-shore environmental sensitivities by reducing oil contact.	• Protection and deflection equipment and resources required to be deployed to protection priorities on-site within 48 hours of the spill event. • Equipment available for protection and deflection will be suitable for the hydrocarbon type, and access to equipment will be maintained.	• Oil Spill Response Capability Review [VOG-7000-RH-0009] contains up-to-date capability assessment of equipment and personnel. • Inspections of third-party providers undertaken in accordance with the Wandoo Field OSCP Part 3: Performance Management [WAN-2000-RD-0001] and Exploration and Survey Operations OPEP Part 3 Performance Management [AUPD24001-VOG-1100-0016]. • IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2] • Oil Spill Response Capability Review [3] • HSEMS Element 12 – Performance Assessment Manual [4]
	Minimise environmental impacts associated with improperly deployed equipment.	• Deployments shall be undertaken by trained incident response personnel. • Tactical response plans will be available for VOGA priority shorelines.	• IAP records. • Tactical response plans for priority shorelines.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
	Minimise impact to fauna from oil spill response activities.	• Establish demarcation zones for vehicle and personnel movement considering sensitive vegetation, bird nesting and roosting areas, and turtle nesting habitat. • Protection and deflection booms shall only be installed after consultation with the Department of Transport and consideration of the sensitive receptors outlined in the Environment Plans.	• IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]

FUNCTIONALITY				
Key Component	**Key Requirement**	**Performance Criteria**	**Assurance Activity**	**Reference**

WAN-WNAB-CP-ER-03-06
Response Strategy - Shoreline clean-up
	Remove stranded hydrocarbons from shorelines without causing greater environmental impact than leaving the hydrocarbons in-situ.	• Equipment for shoreline clean-up tasks that are suitable for environment and hydrocarbon type are available.
		• Shoreline clean-up resources can be deployed to protection priorities within 72 hours.
		• Shoreline clean-up resources will be available within the first three days, consisting of three teams made up of one shoreline team leader and ten shoreline workers.
		• Shoreline teams will be informed of how to minimise damage to flora and avoid encounters with fauna.
		• SCAT teams will complete surveys before clean-up team complete assignments so that priority locations are worked on and suitable techniques are used.
		• Shoreline clean-up will implement a three-stage methodology:
		  ○ Emergency phase – collection of oil floating close to the shore and pooled bulk oil removal.
		  ○ Project phase – removal of stranded oil and oiled shoreline material that cannot be cleaned in-situ.
		  ○ Polishing phase – final clean-up of light oil contamination and removal of oil stains, where the incident Spill Impact Mitigation Assessment demonstrates this is necessary.
		• Waste storage and transport plan will be developed within 72 hours of the spill event.
		• Temporary waste storage equipment and arrangements will be maintained.
			• Oil Spill Response Capability Review [VOG-7000-RH-0009] contains up-to-date capability assessment of equipment and personnel.
			• Inspections of third-party providers undertaken in accordance with OSCP Part 3: Performance Management [WAN-2000-RD-0001] and Exploration and Survey Operations OPEP Part 3 Performance Management [AUPD24001-VOG-1100-0016].
			• IAP records.
				• Wandoo Field OSCP [1]
				• Exploration and Survey Operations OPEP [2]
				• Oil Spill Response Capability Review [3]
				• HSEMS Element 12 – Performance Assessment Manual [4]

	Minimise impact to key shoreline habitats associated with shoreline clean-up activities.	• A shoreline assessment form shall be developed and implemented in consultation with appropriate stakeholders and shall detail controls to minimise environmental impacts. • Sorbents shall not be used for shoreline clean-up on high energy shorelines. • Mechanical removal and high-pressure flushing shall not be undertaken in mangrove areas. • Water from high pressure flushing shall not be directed in between rocks and onto sediment. • Steam cleaning shall not be undertaken on surfaces that support living plants or animals.Tactical response plans will be available for VOGA priority shorelines outlining potential clean-up and waste collection methodologies. • Establish demarcation zones for vehicle and personnel movement considering sensitive vegetation, bird nesting and roosting areas, and turtle nesting habitat.	• Completed shoreline assessment form. • IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]
WAN-WNAB-CP-ER-03-07 Response Strategy - Oiled wildlife response	Minimise and mitigate the number of wildlife oiled following a spill.	• Resources for oiled wildlife response activities have been planned for a Level 6 Oiled Wildlife Response. • First strike response kits are activated within 24 hours. • An Oiled Wildlife Advisor and Wildlife Division Coordinator are activated and assigned to the ICT once the Western Australian Oiled Wildlife Response Plan is activated. • Information contained in Pilbara Region Oiled Wildlife Response Plan and Spill Impact Mitigation Assessment is ground truthed. • IAP wildlife sub-plan developed within 48 hours. • Wildlife rescue and staging site establishment is activated within 72 hours.	• Oil Spill Response Capability Review [VOG-7000-RH-0009] contains up-to-date capability assessment of equipment and personnel. • Inspections of third-party providers undertaken in accordance with OSCP Part 3: Performance Management [WAN-2000-RD-0001] and Exploration and Survey Operations OPEP Part 3 Performance Management [AUPD24001-VOG-1100-0016]. • IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2] • Oil Spill Response Capability Review [3] • HSEMS Element 12 – Performance Assessment Manual [4]
	Minimise potential impacts on fauna caused by oiled wildlife response activities.	• Induction and training shall cover any special handling requirements to minimise further detrimental impacts to flora and fauna. • Wildlife strategy including hazing, if required, shall be developed in consultation with the Department of Transport.	• Oiled wildlife response induction material. • IAP records.	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2]

EFFECTIVENESS				
Key Component	**Key Requirement**	**Performance Criteria**	**Assurance Activity**	**Reference**
WAN-WNAB-CP-ER-01-04 Arrangements are accessible	Current oil spill response arrangements are accessible to all personnel in the event of an oil spill	• Oil spill response documentation is up to date, maintained and readily available within VOGA Information Systems. • Copies of the Wandoo Field OSCP and Wandoo Field Exploration and Survey Operations OPEP are available.	• HSEMS audits of Element 8 are conducted in accordance with the HSEMS Element 12 – Performance Assessment Manual [VOG-1100-YG-1201].	• HSEMS Element 12 – Performance Assessment Manual [4]
WAN-WNAB-CP-ER-01-05 Arrangements are understood	Oil spill response personnel understand and competently perform their response roles	• Drills and exercises shall be carried out to review the effectiveness of the plan. • Oil spill response personnel are competent in their required emergency response roles. • All personnel with roles within the Corporate Command Team, ICT and On-Site Command Team have training appropriate to their roles. • All training courses and participation in drills and exercises are recorded in training records.	• Exercises conducted in accordance with VOGA Emergency Response Schedule [VOG-1100-YH-0001]. • HSEMS audits of Element 8 are conducted in accordance with the HSEMS Element 12 – Performance Assessment Manual [VOG-1100-YG-1201]. • Inspections of third-party providers in accordance with Wandoo Field OSCP Part 3: Performance Management [WAN-2000-RD-0001] and Exploration and Survey Operations OPEP Part 3 Performance Management [AUPD24001-VOG-1100-0016].	• Wandoo Field OSCP [1] • Exploration and Survey Operations OPEP [2] • HSEMS Element 12 – Performance Assessment Manual [4] • Emergency Response Schedule [5] • Platform Operations Manual – Emergency Drill Guidelines [6]

INTERDEPENDENCY

Control Measure	Input / Output	Explanation
WAN-WNAB-CP-ALL-01 Training and Competency	Input	Personnel are competent to perform their emergency response roles
WAN-WNAB-CP-ER-01 Emergency Preparedness, Management and Response	Input	To define the wider emergency response requirements
WAN-WNAB-CE-ES-02 Emergency Communications	Input	To permit relaying of emergency instructions and coordination of emergency response actions

DOCUMENT REFERENCES

Ref	Document No.	Document Title
[1]	WAN-2000-RD-0001	Wandoo Field OSCP
[2]	AUPD240001-VOG-1100-0015]	Wandoo Field Exploration and Survey Operations OPEP
[3]	VOG-7000-RH-0009	Oil Spill Response Capability Review
[4]	VOG-1100-YG-1201	HSEMS Element 12 – Performance Assessment Manual
[5]	VOG-1100-YH-0001	Emergency Response Schedule
[6]	VOG-7000-MN-0001 - WNB-000-001	Platform Operations Manual – Emergency Drill Guidelines

DOCUMENT CONTROL HISTORY

Revision	Description	Comments	Date
A	Issued for review	Initial issue	12 January 2016
0	Issued for use	Issued for use	8 February 2016
1	Issued for use	Issued for use	21 July 2017
2	Issued for use	Issued for use	4 December 2020
3	Issued for use	Issued for use	21 April 2021
4	Issued for use	Issued for use	21 May 2025

APPROVALS

Role	Signature	Date
HSE Manager	ORIGINAL SIGNED	ORIGINAL SIGNED
Environmental Advisor	ORIGINAL SIGNED	ORIGINAL SIGNED
Managing Director	ORIGINAL SIGNED	ORIGINAL SIGNED